

**GO WESTLAND**
**ROTORCRAFT FIRM MARKS A CENTURY OF PRODUCTION**
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# FLIGHT INTERNATIONAL

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21-27 JULY 2015



MILITARY TRAINING

## HAWK HITS NEW HIGH

We hitch a ride aboard RAF's T2, as UK prepares for rest of MFTS transition

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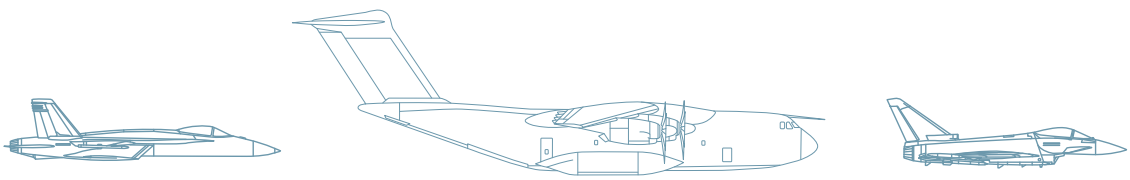
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**VOLUME 187** NUMBER 5498

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Paul Heasman

**COVER IMAGE**

**Royal Air Force Hawk T2 instructor Paul Heasman supplied this stunning shot of the trainer. Our image payment will go to 4 Sqn's role demo charity P26**



**BEHIND THE HEADLINES**

**Craig Hoyle** (*above*) visited the Royal Air Force's **Valley** base on Anglesey to fly in the service's **Hawk T2** trainer (**P26**). **Dominic Perry** had a dose of rotary nostalgia, heading to **Yeovil** to celebrate **Westland's centenary** and see its future (**P23, 24**)



Rex Features

**NEXT WEEK SAFETY**

David Learmount provides our half-year safety review. Plus, we look at the US Air Force's JSTARS Recap battle

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Boeing, Rex Features

**USAF positive on KC-46A Pegasus deliveries P7. Japan signs for V-22 as Osprey wins first export order P14**



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## IMAGE OF THE WEEK

**This US Air Force picture shows two Boeing F-15E Strike Eagles from Mountain Home AFB in Idaho flying alongside the wing of a Boeing KC-135 Stratotanker from Fairchild AFB in Washington. Flightglobal's Ascend Fleets database shows the service as having an inventory of 412 F-15C/Es**

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US Air Force

## THE WEEK IN NUMBERS

**7.8%**

Flightglobal dashboard

Hanjin Transportation sold off its stake in Korean Air as part of a bid to simplify ownership of the national carrier

**$29.3bn**

Flightglobal.com

IATA's June forecast eyes a 2015 global airline industry net profit – almost double the $16.4bn generated in 2014

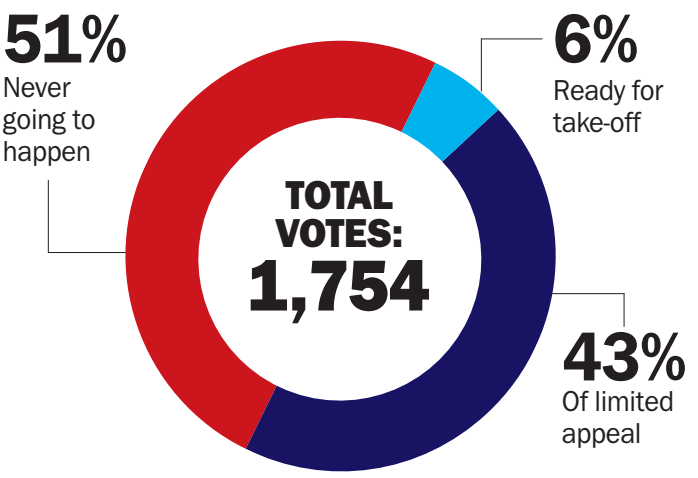
**4**

Flightglobal dashboard

Rotorcraft specialist Lobo Leasing has closed a sale-and-leaseback deal for four AW139s with Omni Helicopters

## QUESTION OF THE WEEK

Last week, we asked: **A joint Russian-Chinese widebody project:**
You said:




This week, we ask: **The lifting of sanctions on Iran:**
**❑ Will prompt Airbus and Boeing commercial sales**
**❑ Good news for China and Russia ❑ Won't last beyond 2015**
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# Training to fight

Things didn't go entirely to plan when the UK introduced its new advanced jet trainer in partnership with industry. Hopefully, both have learned their lessons – and just in time

According to an old military maxim, it is essential to "train as you fight", if an armed service is to remain effective under the toughest of operating conditions.

By the UK's own admission, its pilot training system was failing to deliver on multiple fronts at the turn of the century. Students were spending too long passing through a pipeline with frequent blockages, and which was also failing to fully prepare them for the advanced types they were to fly on the frontline.

As was often the case around that time, the Ministry of Defence's proposed solution was controversial, as it involved embracing a traditional foe: industry. A "training system partner", trusted with every detail of expected student numbers and output standards, would read the tea leaves and select, acquire and support new aircraft to replace its antiquated fleets.

**More must be done to get the best out of the new-generation Hawk, but that will happen**

Of course, it wasn't that simple in reality. The MoD answered part of its own exam question by ordering 28 BAE Systems Hawk T2 advanced jet trainers a full two years before contracting Lockheed Martin/Babcock International joint venture Ascent Flight Training for the rest of its Military Flying Training System (MFTS).

A recent National Audit Office report details the consequences, and how Ascent struggled to create a training syllabus for a type that it had not selected, and for which few "subject matter experts" existed. Things came to a head when training was halted for several months, the manual was rewritten with Royal Air Force help, and a shortage of instructors tackled.



BAE Systems

**Are we both heading in the same direction?**

That feels a long time ago now, with the Valley-based aircraft of the RAF's 4 Sqn delivering solid results and all speaking of a harmonious partnership now being enjoyed with Ascent. More must be done to get the best out of the new-generation Hawk, but that will happen.

But a significant new test for this upliftingly positive relationship is looming large, with the remainder of the MFTS infrastructure yet to be ordered. A delayed award is expected later this year for the delivery of a trio of new fixed-wing designs, to be followed soon after by two new helicopter models. That means five types to be ordered, built and certificated for military operation within three years, with little or no opportunity to further extend the use of legacy kit.

Many other air forces have visited RAF Valley and expressed envy at the standard of equipment now available to its students. If the UK has learned from its mistakes and achieves what is expected through the remainder of the MFTS renewal process, the template could be replicated around the world. ■

**See News P7, Feature P26**

# Oh, the well-contained thrill of it!

Setting records can be much harder than it looks. In this age of big budgets, high technology, computer simulation and exotic materials, it can take some doing to convince people that doing something new was in fact difficult – not to mention dangerous.

Take the Solar Impulse round-the-world flight project. After six legs and a couple of solar-powered endurance records, weather forced a diversion to Japan; there, the wait for a weather window stretched to a month before opening up to allow a five-day, five-night hop to Hawaii – and a new record.

Following the flight via the internet conveyed little of the anxiety that must have accompanied pilot André Borschberg who, it emerged on arrival, was flying on batteries terminally damaged by the stress of the flight. Had it all gone wrong, he would likely have been all right with the inflatable life raft, satellite beacon and radio that Amelia Earhart would have liked to have carried.

Or, consider Didier Esteyne. His first electric-powered English Channel crossing looked easy, at least when viewed through the eyes of Louis Blériot – who saw fog and the unknown, rather than speedboat escorts, carbonfibre and modern meteorology.

But to compare today's record breakers with barnstorming pioneers is to miss the point, which is very much not the human thrill of it; what matters now is to do things better, more safely, cleanly and reliably. ■

**See This Week P6**

For more coverage about the international defence sector, visit our landing page at **flightglobal.com/defence**

For the latest research and development news visit flightglobal.com/technology

# BRIEFING

### QATAR GROWS FREIGHTER FLEET WITH FIRST 747-400F

**CARGO** Middle Eastern carrier Qatar Airways is to introduce its first Boeing 747-400 freighter, which will operate for the airline's cargo division. Qatar Airways says that the jet, a 747-400BCF converted freighter, will be brought into its fleet at the beginning of August. But the aircraft will be replaced two months later by a 747-400F, in order for the airline to take advantage of the type's nose-door loading. Qatar Airways Cargo currently uses eight 777 and six Airbus A330 freighters, and is expanding its fleet with more of each type.

### PAKISTAN SHOOTS STRAIGHT FOR SNIPER UPGRADE

**SENSORS** Lockheed Martin will supply Pakistan with 15 Sniper advanced targeting pods and upgrade 22 units already in service aboard Karachi's F-16 fleet. The work was awarded through the US government's Foreign Military Sales mechanism, says Lockheed. Deliveries and upgrade work will begin in 2015. Pakistan's air force has been increasingly active in recent years, attacking insurgent positions in the west of the country. Flightglobal's Ascend Fleets database records Pakistan as operating 45 F-16A/C fighters.

### COMAC FAIRING WELL WITH C919 FINAL ASSEMBLY

**DEVELOPMENT** Chinese airframer Comac has taken delivery of the wing-body fairing section that will be installed on its first C919 flight-test aircraft. The composite component – manufactured by Hafei Aviation – has been in development since 2012, but has proved more complex than initially envisaged, it says. First flight of the indigenous narrowbody is scheduled for 2016.

### IAG AND VUELING BOSSES TAKE TOP HONOURS

**AWARDS** IAG chief executive Willie Walsh and Vueling boss Alex Cruz have taken top honours at the Airline Strategy Awards organised by *Airline Business* magazine, in partnership with executive search firm Spencer Stuart. The Executive Leadership Award went to Walsh, while Cruz was presented with the Airline Business Award. Other winners include IndiGo president Aditya Ghosh as recognised for Low-Cost Leadership, and former Aer Lingus boss Christoph Mueller, who won the Regional Leadership award.

### ARIANE 5 RACKS UP 66TH CONSECUTIVE SUCCESS

**SPACEFLIGHT** Europe's heavy-lift Ariane 5 rocket racked up a 66th consecutive success on 15 July, orbiting an Airbus-built weather satellite and a Brazilian telecommunications unit. Flight VA224 from Kourou was the third Ariane 5 flight this year and the third for Airbus Safran Launchers, the new joint venture that is now prime contractor.

### INDIA ADDS TO P-8I FLEET AS IT FIRMS FOUR OPTIONS

**ORDER** India's Defence Acquisition Council has cleared the purchase of four additional Boeing P-8I long-range maritime reconnaissance aircraft for the nation's navy. It approved the conversion of four options on 14 July. These are in addition to eight examples purchased under a 2009 deal worth $2.1 billion. Further approval from the finance ministry is now required.

### FRIED BATTERIES GROUND SOLAR IMPULSE IN HAWAII

**TECHNOLOGY** Bad news turned worse for the Solar Impulse round-the-world flight as time estimates to replace batteries ruined by overheating on its record-breaking five-day leg from Nagoya to Hawaii jumped from "two to three weeks" to "several months" – leaving the all-solar aircraft grounded mid-Pacific until at least April 2016.




Rex Features

**Speeds of 200kt have been reached with the demonstrator**

**MILESTONE** **DAN THISDELL** LONDON

# Airbus electrified by e-Fan's historic Channel crossing

Manufacturer reveals numerous enhancements over initial prototype as it closes on final design for production aircraft

When Airbus's e-Fan demonstrator made the first-ever battery-powered crossing of the English Channel from Lydd to Calais on 10 July, the well-trailed 40nm (74km), 37min flight made headlines as far afield as the USA and Australia, not to mention England and France.

But the exercise was far more than a barnstorming publicity stunt. The aircraft has been extensively developed from the version unveiled at Bordeaux in 2014, and Airbus is driving hard toward commercial production.

Detlef Müller-Wiesner, who heads Airbus's electric aircraft directorate, says the preparation for the cross-Channel flight was a significant learning experience.

The aircraft, which features tandem seats and twin ducted fans driven solely by battery power, made its 100th flight last month at the Paris air show.

However, the aircraft flown at Le Bourget, and then from Lydd to Calais, has been heavily modified since last year – and Airbus has worked hard with France's DGAC civil aviation authority to verify the safety and reliability of electric flight components, for which there are as yet no standing certification rules.

Performance improvements to the aircraft – which Müller-Wiesner likes to call "e-Fan 1.1" – include increased endurance to 1h, up from 45min in its earlier iteration, and agility. In test flights e-Fan has now reached altitudes as great as 3,500ft, and a maximum speed of 200kt (370km/h).

All of these developments are helping Airbus engineers with the final design of the 2.0 model, which will make its first flight in late 2016 or early 2017. Volume production will then kick off at a purpose-built factory in Pau, southwest France, where ground will be broken later this year.

Meanwhile, Airbus is readying further modifications to its demonstrator. A "1.2" version will test the systems that will end up in a four-seat hybrid aircraft called e-Fan 4.0, which will add a kerosene-engine "range extender" to the battery power pack.

In Calais, Airbus engineers have a test bench ready for the extender and flight testing should begin "soon", says Müller-Wiesner. ■



Tired crew's visual approach tripped terrain alert
AIR TRANSPORT P10

**DEVELOPMENT** **STEPHEN TRIMBLE** WASHINGTON DC

# Largest Dreamliner stays on schedule

787-10 passes critical design review step keeping double-stretch variant of widebody twinjet on track for 2018 service entry

Boeing has passed the critical design review (CDR) milestone for the 787-10 programme. By clearing the stage in late June, the development team "validates priorities and progress to ensure that the design will meet all requirements when engineering is released to production," the company says.

The CDR precedes both the critical programme review – also known as Gate 8 – and the 90% design release milestone, when engineering drawings are turned over to the production staff and supply chain. Those groups, in turn, start building components for the first test aircraft.

So far, the 787-10 development has stayed on schedule. Boeing cleared the CDR milestone for the smaller -9 in September 2011, or almost three years before the type entered service in July 2014. The third member of the Dreamliner family is due to follow that pattern and enter service in 2018.



Boeing

So far the airframer has accumulated 140 orders for the -10

"We're pleased with our progress on the 787-10, which continues on track toward 90% design release before year-end and first delivery in 2018," Boeing says.

The company announced completion of the CDR milestone to employees in early July.

In June, Boeing vice-president for aircraft development Scott Fancher said the 787-10 also was meeting another key goal, which is to maintain as much commonality as possible with the 787-9.

The first stretch of the original 787-8 needed to incorporate many minor changes to improve reliability and performance, including the addition of a hybrid laminar flow control system in the leading edge of the vertical tail.

Boeing hopes to maximise the earnings potential of the 787-10 by reusing the same systems and structures as the 787-9. It is lengthening the fuselage by 5.5m (17ft 1in), but using software adjustments to negate the need to increase the size of the horizontal stabilisers.

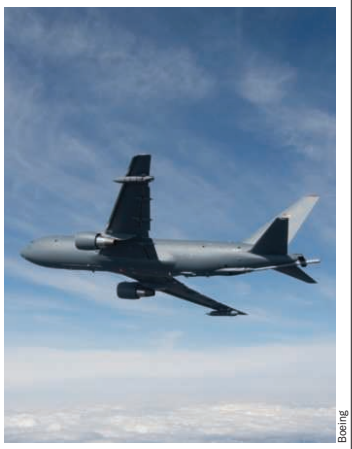
Boeing launched the 787-10 at the Paris air show in 2013, but the order backlog has remained stuck at around 140 aircraft. The only commitment so far this year is from All Nippon Airways, which converted three existing orders to the larger variant. ■

**TANKERS** **JAMES DREW** WASHINGTON DC

# USAF positive on Pegasus deliveries

The US Air Force's programme executive officer for tankers is cautiously optimistic that Boeing can deliver its first 18 operational KC-46A Pegasus aircraft by August 2017, although challenges remain.

The $50 billion tanker programme encountered significant delays late during its development phase due to wiring issues, software troubles and parts delivery delays, and the first flight of a pure KC-46A is expected to occur between now and September: between seven and nine months late.



Boeing

The 767-2C is in flight testing

Brig Gen Duke Richardson says a schedule risk assessment completed earlier this year found some ways to make up for lost time, and concluded that the so-called required assets available target of 18 tankers is still achievable, despite changes to the first flight and low-rate initial production (LRIP) decision dates.

"When we first set up the programme, we had about six months of margin. That margin is now gone," Richardson tells *Flight International*. "I do think it's achievable, but it's not without risk."

The programme has been rephased since the wiring issue, and an LRIP decision that was due in August is now expected between January and April next year. That will trigger pre-negotiated contracts for Lots 1 and 2 of production, for seven and 12 aircraft respectively.

KC-46A engineering and manufacturing development aircraft EMD-2 is expected to undergo heavy testing in October and November, to assess the aircraft's refuelling systems and identify any significant problems which could cause design changes, ahead of a milestone C production decision. Delays mean a larger portion of the total 2,400h test programme will now be done after that point.

"Things are taking longer than anticipated, but we are marching through the programme exactly as we built it," Richardson says. "We haven't changed the structure. [Boeing has] not backed away from anything in terms of their contractual commitment," he adds. ■

**PROCUREMENT**
**CRAIG HOYLE** LONDON

# UK trainer fleet updates are to Affinity's liking

Contracts to acquire the additional 38 aircraft needed to modernise the remainder of the UK's fixed-wing military training fleet are likely to be signed in September or early October, programme officials say.

Elbit Systems/KBR joint venture Affinity is to provide 23 Grob Aircraft G120TPs, 10 Beechcraft T-6Cs and five Embraer Phenom 100s under the UK Military Flying Training System deal, with full capability to be in place by December 2019.

A preferred bidder announcement to replace its current training helicopters is also expected late this year, with an award to follow next year and operational services to start in April 2018. ■

See Feature P32

For more coverage about rotorcraft programmes, go online at flightglobal.com/helicopters

**ROTORCRAFT** **DOMINIC PERRY** YEOVIL

# EASA gives approval to AW169

AgustaWestland has finally secured certification for its new AW169 light-twin helicopter – over six months later than planned – clearing the way for it to begin deliveries of the 4.6t rotorcraft.

EASA approved the AW169 on 15 July, says the airframer. It also confirms a 100kg (220lb) increase over the previously listed maximum take-off weight.

Speaking at a 12 July event at its Yeovil, UK manufacturing facility, Daniele Romiti, AgustaWestland chief executive, blamed the certification delay on the complexity of the effort, specifically around new-generation equipment. "As soon as technology enhances capability of the products, so it impacts on certification," he says.

In addition, certification for the limited ice protection system on the larger super-medium



AgustaWestland

**MTOW is now listed as 4.6t**

AW189, will be achieved "within weeks", says Romiti.

However, the more comprehensive full ice protection system for the type will not come until the second half of next year.

The availability of ice protection is partly behind the delayed service entry of the search and rescue variant with Bristow Helicopters in the UK. So far, the operator has received three examples of the 8.3t rotorcraft, but has yet to deploy them to active bases. ■

**UNMANNED SYSTEMS** **STEPHEN TRIMBLE** WASHINGTON DC

# Aurora hopes for stellar performance from Orion

Aurora Flight Sciences still expects to see "significant demand" for its long-endurance Orion unmanned air system, eight months after a record-breaking demonstration flight.

The Fédération Aéronautique Internationale (FAI) on 1 July confirmed that the Orion established a new record for duration of flight by an unmanned air vehicle.

Its 80h 2min 52s flight from 5-8 December 2014 easily beat an unofficial mark of more than 50h set by Boeing's Condor programme in 1989. Aurora developed the Orion under contracts with the US Army and US Air Force at the height of combat operations in Afghanistan, when US military leaders pushed for ever-increasing levels of intelligence, surveillance and reconnaissance support.

Large-scale ground operations by US troops in Afghanistan and Iraq have faded, but there is still demand for long-endurance surveillance aircraft, says Aurora founder and chief executive John Langford.

He cites a 10 June speech by House Defense Appropriations subcommittee chairman Rodney Frelinghusen, who noted that US military commanders keep testifying that "only a fraction of [intelligence-gathering] requirements are being met".

"The most important recognition for the Orion will come when the aircraft is put to work meeting exactly what the US warfighter is calling for – unmanned persistent surveillance of our enemies," Langford says. "We stand ready to meet this growing demand." ■

**INVESTIGATION** **DAVID KAMINSKI-MORROW** LONDON

# A319 lost cowls after service mix-up

BA flight departed with engine covers unlatched as technicians mistook larger Airbus for jet they had already worked on

Investigation into an engine-cowl loss on a British Airways Airbus A319 has found the component was left unlatched by technicians who inadvertently mixed up the aircraft with another Airbus during overnight maintenance at London Heathrow.

The technicians opened the cowls on the A319's engines to carry out oil servicing of the integrated drive generator. But they did not have the necessary oil pump to complete the work, and left the cowls closed but unlatched while they moved on to inspect other aircraft and fetch the pump.

When they returned to the A319, some 3h later, they inadvertently drove past the aircraft and instead pulled up next to an A321 parked four stands further along.

Despite noticing that the A321's cowls were shut and latched, and despite finding that its oil level did not need servicing, the technicians failed to realise that they were dealing with a completely different aircraft.

The UK Air Accidents Investigation Branch says the pair did not check the aircraft registrations, and simply reasoned that a third party had closed the cowls in their absence.

Although the A321 is physically larger than the A319, the prevalence of single-aisle Airbuses in BA's fleet, carrying the same livery and parked at similar-looking stands, could lead to visual confusion, it states.

Although the cowl doors were subsequently closed correctly on the A321, the mix-up meant that the A319 was not revisited.

Its doors had neither been propped fully open, nor closed and latched, which made the pilots' task of visually detecting the oversight more difficult during the following morning's pre-flight walk-round.




Rex Features

**Damage caused a fuel leak and fire on the starboard powerplant**

As a result the A319's unlatched cowls went undiscovered and they were subsequently torn from the aircraft's engines as it departed for Oslo on 24 May 2013.

Damage from the cowl loss caused a fuel leak and fire in the starboard powerplant, which was shut down in flight. The aircraft returned to Heathrow and landed safely, with no injuries among the 80 occupants. ■



Tired crew's visual approach tripped terrain warning alert
AIR TRANSPORT P10

**ANALYSIS** **DAVID KAMINSKI-MORROW** LONDON

# MH17 leaves lasting scars on aviation

While the precise circumstances of the tragic accident remain murky, its effects and efforts to prevent a repeat are clear

Dutch investigators aim to deliver their conclusions over the destruction of Malaysia Airlines flight MH17 in October, but while the precise circumstances remain obscure, the effects of the loss and the efforts to prevent a recurrence are already clear.

With a surface-to-air missile attack on the Boeing 777-200ER over Ukraine still the prime suspect in the 17 July 2014 incident, carriers have focused their response on conflict avoidance.

European analysis has revealed MH17's effects on traffic in the vicinity of Ukraine. Airspace concerns centred on Crimea's Simferopol flight information region (FIR) had already resulted in a traffic deterioration from February last year.

But the crisis over Ukrainian airspace safety following the crash, and the closure of particular sectors, has been reflected in the traffic patterns. As carriers have avoided east Ukraine they have generated "far above forecasted increases" in traffic over neighbouring states in south-eastern Europe, says Eurocontrol.

It describes the loss of MH17 as "undoubtedly the most significant event" in European airspace last year.

Traffic in Ukraine slumped by almost 37% – the equivalent of 500 daily flights – while that over Moldova was down by 24%, as airlines avoided Simferopol by skirting the Chisinau FIR.

## BENEFICIARIES

Bulgaria and Romania – whose traffic levels climbed by 24% and 16% respectively – were among the largest beneficiaries, while Hungary, Slovakia and Turkey recorded increases of around 10-12%.

"This unexpected influx of traffic was handled effectively, with minimal delay to airspace users," says a Eurocontrol analysis, attributing this to strategies including deployment of non-rostered controllers and restructuring of leave.



Rex Features

**All 298 occupants of the Boeing 777-200ER were killed**

Over the period from February to August 2014, horizontal en route efficiency – which compares the actual distance flown with that of the filed flight plan – deteriorated substantially for city pairs affected by the Ukrainian crisis, more than offsetting a performance improvement on unaffected pairs.

Ukraine is one of 12 countries about which information has been submitted to a newly-developed conflict-zone repository, established under the supervision of ICAO in the wake of the MH17 crash.

The repository, which is in a trial phase, is intended to be an easily-accessible source of reliable intelligence regarding potential threats to civil aviation. It brings together information forwarded by national authorities to enable airline route planners to assess risks.

Almost all of the information available through the online portal has been produced by just three countries – the UK, France and the USA.

The portal includes a number of formal responses by representatives of the states whose airspace is classified as hazardous. Egyptian authorities, for example, notified ICAO of a doubling of the minimum altitude limit to 23,000ft on a specific airway to Gaza.

> **"There are no other risks to civil aviation in other parts of Ukrainian airspace"**
> **STATE AVIATION ADMINISTRATION**

Ukraine's state aviation administration formally told ICAO in April, when the repository became live, that there were two parts of Ukrainian airspace which "could be considered" as conflict zones: a restricted section of Dnipropetrovsk FIR, including a buffer region, and a prohibited area within Simferopol FIR.

"There are no other risks to civil aviation in other parts of Ukrainian airspace," the administration added, although it pointed out that it intended to notify Russian authorities about possible risks, arising from the declared conflict zones, to civil aircraft in Russian airspace.

But the repository also reveals some formal objections to the risk assessments submitted to ICAO.

## INDIGNATION

Sudan's civil aviation authority has expressed indignation over a French order that the country's aircraft maintain an altitude of at least 24,000ft inside the Khartoum FIR.

It insists it has an "effective system" to react to "any military operation", including suspected armed conflicts. "The system has been designed to ensure that no civil aircraft is exposed to any threat at any level," it adds.

The Sudanese authority says it is prepared to close affected routes if necessary and has accommodated re-routing requests from operators, including British Airways and KLM, in order to avoid suspected regions of conflict.

Its diligence in maintaining safe airspace means it is "fully convinced" that the dissemination of information submitted by France "will not add new useful facts" for operators using its airspace.

Dutch investigators have been carrying out a parallel examination, alongside the main MH17 probe, into the decision-making process conducted when airlines select flight routes. Draft final reports on both inquiries were put before accredited representatives – who have 60 days to comment – at the beginning of June.

MH17 had departed Amsterdam for Kuala Lumpur. Dutch passengers made up a large proportion of the 298 occupants and Dutch ministers intended last week to explore whether ICAO could play an expanded, and better-clarified, role in identifying security issues in the airspace above conflict zones. ■

To keep up to date with the latest developments in aviation safety visit: flightglobal.com/safety

PRODUCTION
**STEPHEN TRIMBLE** WASHINGTON DC

# Embraer lifts its second quarter output by 35%

Embraer ramped up its deliveries in the second quarter, handing over 27 commercial aircraft to customers.

The result, announced on 15 July, exceeds the Brazilian manufacturer's output of commercial aircraft in the first quarter by 35%.

Deliveries in the period to 30 June numbered 22 Embraer 175s, three E190s and two E195s.

The company's backlog, meanwhile, swelled in the second quarter with the help of $2.6 billion-worth of announcements made at the Paris air show.

The backlog now includes 531 firm orders for commercial aircraft, along with 721 options.

Of that total, 264 firm orders and 456 options relate to current-generation E-Jets, with the remaining 267 firm orders and 265 options accounted for by re-engined and rewinged E-Jet E2-family aircraft.

Deliveries of the first examples of the next-generation twinjets are due to start in 2018 with the E190-E2.

In addtion to its commercial aircraft, during the quarter the airframer also handed over 26 light business jets – six Phenom 100s and 20 Phenom 300s – alongside seven large corporate aircraft – three Legacy 500s, three Legacy 650s, and a single Lineage 1000.

Its total orderbook now amounts to a record $22.9 billion, beating the previous high of $20.4 billion. ■

**EMBRAER BACKLOG**

| Model | Backlog |
|---|---|
| E170 | 5 |
| E175 | 168 |
| E190 | 66 |
| E195 | 25 |
| E175-E2 | 100 |
| E190-E2 | 77 |
| E195-E2 | 90 |
| **Total** | **531** |

SOURCE: Embraer




Airteammages

**The aircraft came within 600ft of the ground during the incident but landed safely after a go-around**

INVESTIGATION **GREG WALDRON** SINGAPORE

# Tired crew's visual approach tripped terrain warning alert

ATSB finds Qantas captain's performance was "reduced due to disrupted sleep and virus"

Qantas Airways has updated its training for visual approaches following an incident in which the crew of an Airbus A330-200 (VH-EBV) misjudged an approach into Melbourne airport, triggering the aircraft's enhanced ground proximity warning system (EGPWS).

The Australian Transport Safety Bureau (ATSB) says the 8 March 2013 incident, which it categorises as "serious", took place in daylight during the early evening, when the aircraft was inbound from Sydney with 11 crew and 211 passengers aboard.

ATSB says the captain and first officer were at the end of a five-day roster pattern, and had flown a Perth-Sydney service earlier that day. After being cleared for approach, the captain set an altitude target of 1,000ft, selected gear down, and 180kt (333km/h) as the target speed.

As the aircraft descended through 1,800ft, the first officer told the captain the aircraft was low. The captain reduced the rate of descent, but the EPGWS issued "terrain" alerts followed by "Pull Up" commands. At this point the aircraft was at 1,400ft above sea level, but only 600ft above the ground – and 1,900ft below a normal 3° descent profile. The captain applied full power and conducted a go-around before eventually landing uneventfully.

"During the visual approach the captain's performance… was probably reduced due to disrupted and restricted sleep, a limited recent food intake and a cold/virus," says the report. "The captain assessed the aircraft's flight path using glide slope indications that were not valid. This resulted in an incorrect assessment that the aircraft was above the nominal descent profile."

The A330 made a "significant deviation" below the normal descent profile, says the ATSB, and although the crew reacted to slow the rate of descent this did not "prevent the aircraft descending outside controlled airspace and the activation of the EGPWS".

Qantas has responded to the incident by updating training materials for visual approaches, and added questions for check pilots to help gauge crew proficiency.

Visual approaches were also introduced as a topic for discussion during crew route checks between 2013 and 2015. ■

ENHANCEMENT

# First L-410 NG rolled out at Kunovice

Aircraft Industries on 15 July rolled out the first example of the enhanced NG variant of its long-running L-410 commuter turboprop.

First flight of the model is anticipated in the coming days from its facility at Kunovice airport in the Czech Republic.

Changes over the previous L-410UVP-E20 include a modified wing, additional fuel tanks – increasing range to 1,350nm (2,500km) and endurance to 10h – a larger cargo compartment, and a Garmin G3000 full-glass cockpit.

The NG additionally gains GE Aviation H85 engines, each with a maximum take-off power of 850hp (634kW), while cutting the maximum propeller speed to 1,950rpm from 2,080rpm previously. Cruise speed also rises to 225kt (417km/h).

Although the 19-passenger aircraft is principally targeted at short-haul commuter operations in remote or underdeveloped areas, the Russian-owned manufacturer also highlights its suitability as a maritime patrol or surveillance platform.

Serial production is scheduled to begin in 2017, with output eventually rising to 30 aircraft per year, it says. ■



Nuclear deal clears Iran to renew elderly airliner fleet
AIR TRANSPORT P12

REPORT **JON HEMMERDINGER** WASHINGTON DC

# National rejects NTSB view of fatal 747 freighter crash

Airline claims safety board did not fully investigate possibility of "explosives being a factor"

National Airlines has rejected the US National Transportation Safety Board's (NTSB) conclusion that the 29 April 2013 crash of its Boeing 747-400 Freighter was caused by improperly restrained heavy cargo.

Mark Dombroff, the carrier's lawyer, says National believes it followed proper procedures covering restraint of the heavy military vehicles inside the aircraft.

National stands by its view that the NTSB did not adequately investigate the possibility that an explosion brought down the freighter, he adds.

"National has great respect for the NTSB, but the company disagrees with the conclusions that the board has reached," Dombroff says. "The company is particularly disappointed with the depth and scope of the investigation related to explosives as being a factor."

The 747 (N949CA) crashed shortly after take-off from Bagram air base in Afghanistan, killing all seven crew on board.

In its final report synopsis released on 14 July, the NTSB concludes the crash occurred when one of five mine-resistant ambush-protected (MRAP) military vehicles broke free from restraints, damaging two hydraulic systems and components of the 747's horizontal stabiliser.



Rex Features

**Carrier National points out the 747-400F crashed in a warzone**

The NTSB's synopsis places blame on National for having inadequate procedures for restraining heavy cargo, and for not following specifications set by Boeing and Telair, which makes the aircraft's cargo system.

Manufacturers' manuals should have limited the aircraft to carrying just one MRAP, says the NTSB, which also faults the Federal Aviation Administration for inadequate oversight.

"There is no evidence that an explosive device or hostile acts were a factor in this accident," says the synopsis. But National says the NTSB's examination did not fully rule out foul play and that a closer study should have been conducted, especially considering the aircraft was operating in a warzone.

Investigators analysed only three pieces of wreckage for explosive evidence and did not involve the Federal Bureau of Investigation, Dombroff adds.

National believes the NTSB's conclusion that damage to the aircraft's systems were caused by a shifting MRAP is "not supported by direct evidence", he adds, and could have been caused by their impact with the ground. ■

COUNTERMEASURES **ARIE EGOZI** TEL AVIV

# Israeli carriers shelter under SkyShield

Elbit Systems' SkyShield technology has been put into service to protect Israeli passenger aircraft flying to "sensitive" destinations, after the installation was accelerated in response to intelligence reports.

Those reports highlighted the threat from shoulder-launched missiles in the hands of militant groups ISIS and Hezbollah.

Following approval by Israel's civil aviation authority, Elbit's Commercial Multi-Spectral Infrared Countermeasure system has been installed on aircraft operated by carriers Arkia, El Al and Israir.

SkyShield was developed by Elbit subsidiary Elop, which offers a family of directional infrared countermeasure (DIRCM) systems for protecting aircraft against heat-seeking ground-to-air missiles. These systems integrate fibre-laser technology with a high-rate thermal camera and a dynamic mirror turret.

Initial detection of incoming threats is provided by a missile warning system. The warning is passed to the DIRCM, which directs a thermal tracker to acquire and track the threat. A laser beam is then fired at the missile, deflecting it away from the aircraft.

In November 2002, a weapon was fired at an Arkia Boeing 757 on departure from Mombasa in Kenya. This prompted a decision to equip Israeli passenger aircraft with flare-based countermeasures, although these were later abandoned after protests from other countries. ■

INVESTIGATION
**JON HEMMERDINGER**
WASHINGTON DC

# ATC errors led to near-miss event at Liberty airport

US investigators have determined that errors made by an air traffic controller nearly resulted in a midair collision between two passenger jets at Newark Liberty International airport last year.

The National Transportation Safety Board report into the 24 April incident says the aircraft – an ExpressJet Airlines Embraer ERJ-145 and a Boeing 737-800 operated by United Airlines – came within 1,580ft laterally and 400ft vertically of one another.

NTSB says the incident resulted from "the local controller's failure to comply with Federal Aviation Administration separation requirements for aircraft operating on intersecting runways."

**Realising the spacing between aircraft was insufficient, the pilots of the United aircraft were instructed to execute a go-around**

According to the report, air traffic control cleared the ERJ-145 for take off at 15:02 local from Newark's runway 4R.

At the same time, a United Airlines 737 was 2.6nm (4.8km) away on final approach to Newark's runway 29, which intersects with the end of runway 4R.

However, the ERJ-145's pilots did not begin their take-off roll for some time after the clearance had been given, by which point the 737 was just 1nm away at 200ft. Realising the spacing between the aircraft was insufficient, the controller instructed pilots of the United aircraft to break off their approach and execute a go-around.

The ERJ-145 continued its take-off and was overflown by the United narrowbody at the intersection of the two runways. ■

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REGULATIONS
**AARON CHONG** SINGAPORE

# IATA repeats its call for cuts to Indian red tape

IATA chief executive Tony Tyler has repeated calls for the Indian government to reduce the regulatory and tax burdens airlines in the country face.

He says that despite robust growth and some airlines returning to profit in 2015, the sector is still expected to report an aggregate loss of $1 billion this year.

"Onerous regulation and processes, debilitating taxes and expensive infrastructure are holding back the industry's ability to deliver greater economic benefits to India," Tyler told attendees at an industry conference in New Delhi.

Tyler identifies three priority areas for the government to assist the aviation sector – cutting taxes, more competitive fuel pricing, and greater independence for the nation's Airports Economic Regulatory Authority (AERA).

IATA says the country should work harder to lower taxes on jet fuel, which in some Indian states can be up to 30%. "The decision to introduce competition in jet fuel supply at key airports needs to be followed up with open access to the pipelines that get fuel to the airport," says Tyler.

The AERA needs greater freedom to "do its work", says Tyler, noting recent legal challenges that have prevented the authority's recommendation of a 78% reduction in New Delhi's airport charges from being implemented.

"Regulation is also holding back the development of the sector. Well-intentioned regulations, but which are inconsistent with global standards, make doing business in India very difficult for the airlines," adds Tyler. ■



Rex Features

**Fuel tax can be 30% in India**



Rex Features

**Flag carrier Iran Air has an ageing fleet, although it has managed to acquire more modern types**

POLITICS **DAVID KAMINSKI-MORROW** LONDON

# Nuclear deal clears Iran to renew elderly airliner fleet

USA, Europe, China and Russia lift commercial sanctions as weapons programme is halted

Iran will be allowed to acquire commercial aircraft under the newly-agreed comprehensive action plan negotiated to halt progress on the country's nuclear weapons programme.

The joint plan agreed with US, European, Chinese and Russian diplomats sets out a detailed list of restrictions that will be eased in exchange for Iran's co-operation.

US sanctions have long prevented Iranian carriers from purchasing aircraft with a substantial number of US-built parts, effectively blocking them from ordering new Airbus and Boeing jets.

But the action plan states that the US government will "allow for the sale of commercial passenger aircraft" as well as "related parts and services" to Iran.

It will enable the export, sale or lease of aircraft for "exclusively civil aviation end-use", the text of the plan adds, while services including maintenance and safety-related inspections for passenger aircraft will also be covered.

European sanctions on Iran have included a ban on access to European Union airports by dedicated cargo flights by Iranian carriers. Under the terms of the joint plan, this ban will also be lifted.

Sanctions on Iranian commercial aircraft had already been partly lifted, in order to provide maintenance services to the country's ageing fleet.

Flag-carrier Iran Air still counts Boeing 747-200s, Airbus A300s and A310s in its fleet, although it has managed over the years to source a number of used Fokker 100s, Airbus A320s and other types. ■

INVESTMENT

## Tehran requires $7.5 billion to reverse fall-out from sanctions

Authorities in Iran believe that renewing the country's passenger aircraft fleet will require investment of $7.5 billion over five years.

The Iranian Civil Aviation Organisation (CAO) disclosed the estimate shortly before US and European negotiators concluded a long-term agreement over the country's nuclear programme. Progress on the talks has previously enabled Iranian carriers to access maintenance assistance for their fleets.

The CAO, citing data from the flight standards division, states that an "unprecedented" 168 aircraft were active in Iran and that the operational proportion of the country's air fleet had risen from 60% to more than 67%.

Some 14 additional Airbus and Boeing aircraft have been undergoing maintenance this year, the organisation adds.

The CAO underlines the social, political and economic importance of air transport and points out that other neighbouring countries – among them Turkey, the United Arab Emirates and Qatar – have recently collectively ordered some 800 aircraft in total.

Iran is one of the largest countries in the region but has a relatively small number of aircraft, it says, and the restrictions imposed by US government sanctions means that the average age of its fleet is high, at around 20 years. ■



V-22 nets first export order
DEFENCE P14

**INQUIRY** **DAVID KAMINSKI-MORROW** LONDON

# Missed airspeed risk led to stall-protection activation

Air France A320 was left with "low energy reserve" during its final approach to Marseille

Pilots of an Air France Airbus A320 allowed the jet's airspeed to bleed away while turning for its final approach to Marseille, resulting in the activation of its stall-protection system.

French investigation authority BEA says the A320 (F-HBNE) was operating with a "low energy reserve", given the aircraft's altitude and configuration.

It had been conducting a shortened left-hand approach to runway 31L. The crew had selected full-flap configuration during the downwind leg – leaving the aircraft's autothrust pursuing a target approach speed of 136kt (252km/h).

BEA says this reduced the margins available to avoid a stall during the subsequent turns to base and final, but that this risk was not identified by the crew.

The first officer, who was flying, began the turn to final about 2.4nm (4.8km) from the runway threshold.

He briefly gave nose-down commands, increasing the descent rate to 1,900ft/min, and the jet entered a 26° left bank – and a crosswind from the left – at an altitude of 900ft.

The first officer, noticing that the jet was low on approach, then commanded nose-up for 6s.

While this increased the pitch and reduced the descent rate to 500ft/min, it also led the airspeed to fall away from 143kt to 132kt. The airspeed stayed below the 136kt approach target figure for 6s.

BEA says that the aircraft's angle-of-attack reached 12° and a speed warning sounded. The A320 descended to a minimum height of 474ft above ground before – as a result of the stall-protection system engaging, and the crew's executing a go-around – it began to climb away.

Investigators believe the situation was exacerbated by the absence of deviation call-outs from the monitoring pilot who, it says, remained "confident" in the first officer's ability to conduct the manoeuvre.

None of the 174 occupants was injured during the incident, which followed a flight from Paris on 11 March 2013. BEA points out that the incident bore a number of similarities to an April 2012 event involving an Air France A320 on approach to Tel Aviv. ■




Air France

**The twinjet crew's approach cut the margins for avoiding a stall**



Rex Features

**Investigators believe the A320 was deliberately brought down**

**ANALYSIS**
**DAVID LEARMOUNT** LONDON

## Germanwings disaster adds to crash confusion

Airline safety in the first six months of 2015 has continued to be excellent, according to traditional markers, but the crash in the French Alps of the Germanwings Airbus A320 – believed to have been deliberately caused by the aircraft's co-pilot – has added to the confusion caused by two anomalous losses last year.

The Germanwings event in March this year, combined with disappearance of one Malaysia Airlines Boeing 777 last year followed by the shoot-down of another over eastern Ukraine, have challenged traditional assumptions about the definitions of airline safety.

Assessment of airline safety performance has formerly concentrated on accidents and excluded deliberate acts, so perceptions of industry safety are being affected by what has happened in the past 18 months.

As a result, the whole industry – and those who insure it – are searching for clues as to whether a new trend has established itself, or if these events were just an unfortunate clutch of anomalies.

This issue and others are examined in the *Flight International* half-year safety review, which finds that the number of fatal crashes traditionally classifiable as accidents was five, a figure unchanged from the same period a year earlier. None of them involved jet-powered types.

However, there were 65 resulting fatalities, compared with 28 in the same period last year. ■

**See Feature next week**

**SAFETY** **GHIM-LAY YEO** WASHINGTON DC

# SkyWest risks fines from late checks

US regulator the Federal Aviation Administration proposes levying fines totalling $1.23 million against regional carrier SkyWest Airlines for two breaches of rules relating to airworthiness inspections on its fleet.

The FAA alleges that SkyWest failed to inspect cargo door skins on two Bombardier CRJs at the required intervals, following a 2006 airworthiness directive that called for examinations after cracks were discovered in the structure during fatigue tests.

SkyWest allegedly operated the aircraft on almost 16,000 flights while the inspections were overdue, for which the FAA intends to fine it $911,000.

Separately, the carrier could incur a $320,000 penalty for allegedly operating four CRJs on more than 6,700 flights that had not had their main landing gear components inspected.

The airline has 30 days from receipt of the FAA's enforcement letter to respond.

SkyWest says it is "disappointed" with the proposed penalties. "SkyWest has worked with the FAA to ensure that our aircraft procedures and appropriate checks are conducted as outlined within our maintenance programme," it adds. "We are committed to ensuring every flight we operate is safe and we look forward to meeting with the FAA to review the claims in more detail." ■

To get more defence sector coverage, subscribe to our fortnightly newsletter: flightglobal.com/defencenewsletter

**READINESS**
**JAMES DREW** WASHINGTON DC

# USMC assesses initial F-35B unit to validate IOC

The US Marine Corps has begun its one-week operational inspection of the Lockheed Martin F-35B-equipped Marine Fighter Attack Squadron-121 (VMFA-121) to assess the 10-aircraft unit's combat readiness.

A positive assessment would then pave the way for the service to declare initial operational capability (IOC) for the new short-take-off and vertical landing fighter.

That declaration would mean the squadron is fit to serve aboard an amphibious carrier in a contingency operation, Marine Corps spokesman Maj Paul Greenberg tells *Flight International*. The inspection began on 13 July.

Based at MCAS Yuma in Arizona, VMFA-121 will be assessed on the quantity and quality of its pilots, plus simulator flights and operational flights, and on the unit's ability to surge in exceptional circumstances.

Maintenance teams will be evaluated separately on their maintenance and supply programmes, to ensure they are able to keep the 10 F-35Bs in a combat-ready condition.

"Following the Marine Corps' F-35B IOC declaration, the aircraft will be ready for future deployments aboard the US Navy's fleet of amphibious carriers," Greenberg says. "The first deployment is scheduled to take place in 2017, when VMFA-121 will deploy to Iwakuni, Japan."

The USMC says it is on track for IOC declaration in July, but has separately indicated that an August decision would be acceptable to the service.

The inspection comes after years of preparation and recent test flights aboard the USS *Wasp*. The USMC has a standing requirement for 340 examples of the STOVL type, to replace more than 400 Boeing AV-8B Harrier IIs, F/A-18A/B Hornets and Northrop Grumman EA-6B Prowlers. ■



Rex Features

**Tokyo will take an initial five examples of the tiltrotor, but that could rise to as many as 17 aircraft**

**CONTRACT** **STEPHEN TRIMBLE** WASHINGTON DC

# V-22 nets first export order

Bell Boeing secures Japan as initial overseas customer for Osprey with $332 million deal

Japan is officially set to become the first foreign operator of the Bell Boeing V-22 Osprey after signing a $332 million contract for five of the tiltrotor aircraft.

The foreign military sale – announced on 14 July by the US Department of Defense – is likely to lead to follow-on orders.

The US State Department notified Congress in May that Japan had requested a purchase of up to 17 V-22B Block C aircraft worth $3 billion, which agrees with Tokyo's latest five-year budget plan.

For Bell Boeing, the deal consummates a decade-long quest to confirm an export customer for the tiltrotor. Israel had appeared poised to become the first foreign operator only a year ago, but the country's defence minister shelved the acquisition of six V-22s last October.

"The Bell Boeing team is honoured to have Japan as the first international customer for the V-22 tiltrotor," says Mitch Snyder, executive vice-president of military business for Bell Helicopter.

The V-22's unique capabilities – a 260kt (480km/h) cruise speed coupled with vertical landing – have been highlighted amidst a stand-off between China and Japan over disputed and normally unoccupied islands.

However, Snyder did not specifically refer to the island dispute between the two countries in a statement released by Bell Boeing.

"The distinct performance envelope of the V-22 will provide Japan with an ideal solution when the need arises," he says.

"When assets are required on-target in a location without an airstrip, the self-deployable Osprey provides customers with an unrivalled combination of speed, range, and payload to execute a variety of missions."

The contract award notice indicates that all five aircraft should be delivered to Japan by June 2018. ■

**DELIVERY** **JAMES DREW** WASHINGTON DC

# F-16s arrive as Iraq bolsters stability

The Iraqi air force has received its first four Lockheed Martin F-16s, giving it a much-needed morale boost following a crash that killed a pilot in Arizona, and the accidental bombing of a Baghdad suburb by a Sukhoi Su-25.

Iraq's defence ministry announced on its website on 13 July that the four aircraft had landed at Balad air base, about 43nm (80km) north of the nation's capital.

The first aircraft was due to arrive last September, but was delayed when Islamic State militants overran large parts of the country. Instead, the fighters were diverted to the US Air Force's international F-16 academy at Tucson International airport in Arizona to support pilot training.

Under a $6.5 billion deal, the Iraqi government will acquire 36 F-16IQs (now 35, discounting the destroyed jet), with weapons and support equipment. ■



Lockheed Martin

**Deliveries were delayed after militants overran parts of Iraq**



Traveller near journey's end
BUSINESS AVIATION P18

**MODIFICATION BETH STEVENSON** LONDON

# Wing upgrade lifts Typhoon

Eurofighter gains improved agility and weapons integration with aerodynamic enhancement

Flight-testing of a series of aerodynamic upgrades to the Eurofighter Typhoon swing-role fighter that will increase its agility and ability to carry weapons has been completed by Airbus Defence & Space.

Designed under the Eurofighter Enhanced Manoeuvrability programme, the aerodynamic modification kit includes additional fuselage strakes and root extensions that increase the maximum lift of the Typhoon's wing by 25%, Airbus says.

The increased lift produces "critical fighter capabilities" such as an increased turn rate, tighter turning radius and improved nose-pointing at low speeds. It also provides easier integration of air-to-surface weapons.



Airbus Defence & Space

**Test pilots from Germany, Italy and the UK flew aircraft IPA7**

Eurofighter test pilots from Germany, Italy and the UK completed 36 sorties from Manching, Germany on instrumented production aircraft IPA7, Airbus says, with the flight trials following five years of studies. ■

**TRAINERS JAMES DREW** WASHINGTON DC

# Gravity of USAF T-X requirement puts pressure on competitors' proposals

The US Air Force is maintaining the ambitious sustained *g* requirement for its T-X next-generation trainer, sidelining at least two proposed aircraft types and driving competitors toward clean-sheet designs.

When the competition to replace the 55-year-old Northrop T-38 Talon got underway in 2010, vendors rushed to offer ready-made examples like the Alenia Aermacchi M-346 (as the T-100), BAE Systems Hawk advanced jet trainer and Lockheed Martin/Korea Aerospace Industries T-50 Golden Eagle.

However, the service's initial set of requirements – posted in March – narrowed the field and caused the prime contractors to reassess their initial offers. In a 10 July statement, the Air Education and Training Command (AETC) then confirmed that the minimum T-X sustained *g* requirement of 6.5*g* and objective of 7.5*g* remains unchanged as a key performance parameter, even though it excludes a number of viable trainer options from the competition.

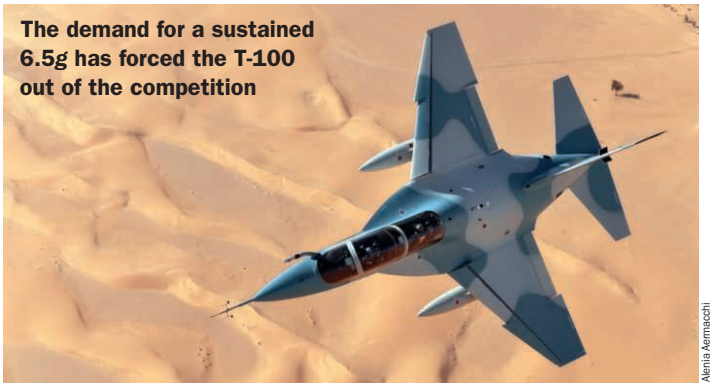
The requirement sets a high bar for manoeuvrability, requiring the T-X to sustain that load at a pressure altitude of 15,000ft for at least 140° of a full turn with minimal loss of energy and altitude.

"Initiated at or above 15,000ft pressure altitude, at or below Mach 0.9, and at or above 80% fuel weight, the aircraft's flight path angle during this manoeuvre can be no lower than 15° nose low while losing no more than 2,000ft of vertical altitude and 10% of the initial airspeed," the AETC says.

This pushes out the T-100, which Alenia says can sustain 5.3*g* at 15,000ft. The Hawk is also out of the race. "If you score us on how much sustained *g* you can pull, we'll lose every time," one BAE business development manager told *Flight International* in 2011.

Boeing and Saab, Northrop and Lockheed have each said they are working on clean-sheet designs, although the existing T-50 still appears to be a viable contender.

Textron AirLand has also been considering a trainer derivative of its Scorpion jet. ■



Alenia Aermacchi

**The demand for a sustained 6.5g has forced the T-100 out of the competition**

**DELIVERY CRAIG HOYLE** LONDON

# G120TPs arrive in Myanmar as Grob orders rise

Grob Aircraft has delivered half of 20 new turboprop trainers ordered by the Myanmar air force, as it also moves past handing over its 50th example of the G120TP.

The German manufacturer has so far supplied four customers with a combined 51 G120TPs. These include Argentina and Indonesia, which have received their full orders of 10 and 18 aircraft respectively, and Mexico, which has accepted 13 from an eventual 25 since February 2015.

Aircraft produced for Mexico and Myanmar are equipped with a full digital cockpit, while analogue systems feature in those delivered to the other current users.

In June, CAE USA also announced plans to buy six of the tandem-seat type to support its delivery of initial and recurrent fixed-wing pilot training services to the US Army and US Air Force. The aircraft will be operated from an airport near Fort Rucker in Alabama under the arrangement, with Grob also to provide associated ground-based training equipment.

Noting that the G120TP has a performance envelope which enables manoeuvres of up to 6*g* to be flown, it says: "the potential to conduct upset recovery training was a very important criteria for the selection".

Meanwhile, a contract award is anticipated later this year via the Elbit Systems/KBR joint venture Affinity, to provide 23 G120TPs to deliver the elementary phase of the UK Military Flying Training System (MFTS). Once fielded as replacements for the nation's current Grob G115 Tutors, these will be operated from the Royal Air Force's Barkston Heath and Cranwell bases in Lincolnshire.

Confirmation of the US and MFTS deals will boost Grob Aircraft's total orders for the G120TP to 102 units for six operators. ■

**See Feature P32**

# France will take the spotlight as "feature country" at Singapore

SINGAPORE AIRSHOW 2016 16–21 Feb

an experia event

Singapore Airshow 2016 will welcome France as the Feature Country in the fifth edition of the show, scheduled to take place from 16 to 21 February 2016, at the Changi Exhibition Centre.

The Feature Country series, which made its debut at the 2014 Airshow, was developed as a permanent feature to enable the companies exhibiting within the pavilion to leverage on the Singapore Airshow as a strategic platform; lending support to businesses of the Feature Country and enabling them to tap the opportunities in the Asia Pacific region and beyond.

The French Pavilion will be located at a prominent spot within the exhibition hall. Participating exhibitors will have access to a dedicated "Deminar" area – a demonstration and seminar area for research institutes and universities to showcase their latest technologies and innovations. In addition, business meetings between the French Pavilion exhibitors and VIP delegations will also be specially facilitated.

"Being a Feature Country at the Singapore Airshow 2016 gives us the unique platform to bring together our latest and best aviation technologies to meet the growing appetite for innovation in the Asia Pacific aviation sector, translating into real business deals for our French companies," said Emeric D'Arcimoles, the Paris Air Show Chairman and Chairman of the







International Committee of Groupement des industries françaises aéronautiques et spatiales.

The French aerospace, defence and security industry is worth 47.9 billion Euros, and specifically, out of which 30.4 billion Euros is contributed by exports. This shows that France is well-placed to leverage its Feature Country platform to bring its latest innovations to the region's top decision-makers converging at Singapore Airshow 2016.

This comes at an opportune time in the Asia Pacific aviation industry, where the commercial aerospace sector is expected to set new records for aircraft production in 2015, off the back of the accelerated replacement cycle of obsolete aircraft and growing passenger travel demand in the Asia Pacific region. Countries in the region are also increasing defence spending to equip their militaries with modern defence platforms and technologies.

Reflecting this growth is the continued expansion of reach and impact of each new edition of Singapore Airshow. The 2016 show is already 80 per cent committed, with specialised spaces like the Aerospace Emerging Technologies Zone, the Training and Simulation Zone and the introduction of the Business Aviation Zone, to further spawn business development opportunities.

**For more information about the Feature Country programme, please contact Mr Danny Soong at dannysoong@experiaevents.com or +65 6595 6123.**

## Hosted Buyers Programme offers new partnership opportunities

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**For more information about the Hosted Buyers Programme, please contact Ms Liliane Lye at lilianelye@experiaevents.com or +65 6595 6126.**

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Traveller near journey's end
BUSINESS AVIATION P18

**DEVELOPMENT** **DOMINIC PERRY** YEOVIL

# AgustaWestland promotes joint vision

Manufacturer urges Italian, UK governments to support work on technologies for use with future attack, utility helicopters

AgustaWestland is calling on the governments of the UK and Italy to back ambitious plans for the development of a next-generation military helicopter that could meet the future requirements of both nations.

Daniele Romiti, chief executive of the Anglo-Italian manufacturer, likens a potential future collaboration to the agreement that underpinned the development of the AW101 in the 1980s.

"The AW101 was a successful joint effort," Romiti said at an event to mark the 100th anniversary of Westland at its Yeovil factory on 12 July. "We are ready to repeat this experience in the future."

AgustaWestland, in common with its rivals, has in recent years concentrated on bringing to market platforms that can serve both the civil and military sectors without requiring deep modifications. However, in this instance Romiti plans to take this a step further, by developing components that could be used across a number of platforms.




**The Anglo-Italian firm is looking for a repeat of the collaboration that helped develop the AW101 in the 1980s**

AgustaWestland

"The most challenging technology in a new helicopter is the drive system and the avionics integration," he says. "These are two areas where we could share a common platform that could be applied to an attack or utility platform. We could have a full drive system ready for a 10-tonne platform."

Romiti is eyeing an emerging need from the Italian army to replace its fleet of AW129 Mangusta attack helicopters – the oldest of which were built in 1990 – and, on the UK side, a requirement for an eventual successor to the Royal Air Force's inventory of 1970s-era Airbus Helicopters SA330 Puma HC2 transports.

Work on the new platforms would be equally shared between the company's facilities in Italy and the UK, says Romiti.

AgustaWestland's parent company, Finmeccanica, is "willing to invest" in any development, he says, but "everyone wants to have clarity" on any proposals. AgustaWestland needs firm direction in next two to three years "or even before in my opinion" if it is to meet a service-entry deadline of around 2025, he says.

"If we did design something that is significant, this is an asset for export for the UK and Italy as well. I think we have a good opportunity in front of us."

Although a new platform could also find traction in the civil market, Romiti says this is not the company's "first priority". ■

**See News Focus P23**

**LAWSUIT**

## Chief executive defends PZL Swidnik legal action in Poland

Daniele Romiti, chief executive of AgustaWestland, is standing by its decision to launch legal action challenging the Polish defence ministry's decision to award a 50-unit rotorcraft order to Airbus Helicopters.

AgustaWestland, in conjunction with its Polish subsidiary, PZL Swidnik, had offered its new AW149 for the tri-service contest, but lost out to the H225M Caracal.

Romiti says its proposal – which also promised to make PZL Swidnik the lead facility for AW149 development – was the only one to offer a new-generation helicopter. He points to the recent launch by Airbus Helicopters of its X6 programme, destined as a future replacement for the H225M, as something that strengthens its argument.

"It is quite enough to say that as soon as a competitor made the announcement of renewing the model that was offered to the Polish, it was [clear] that what was offered was pretty old."

Although he says it is too early to "jump to conclusions" about the future of PZL Swidnik, Romiti acknowledges that if Poland does not have a change of heart, "we will have to revise our strategy there. Maybe we will have to resize and refocus the mission of Swidnik. If the local customer does not need our products, there is no point in keeping the ability to design new platforms."

However, Romiti stresses the importance of the facility as a centre of component manufacture, which could secure its future in the longer term. ■

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CERTIFICATION
KATE SARSFIELD LONDON

# Approvals give Colombia pair of Challengers

Bombardier has received Colombian validation for its Challenger 300 and 350 business jets, paving the way for the super-midsize types to be operated commercially in the country.

The Canadian manufacturer says Latin America is already one of the largest markets for business aviation globally – the region has an installed base of 1,900 executive jets – and is a key driver for the industry's growth.

This optimism is manifested in Bombardier's latest industry forecast, in which it predicts deliveries of 850 light, midsize and large-cabin business jets in the region by 2024. The light and medium categories are expected to account for around 75% of this total.

The $26.5 million Challenger 350 was launched in May 2013 and entered service in June the following year. To date, nearly 70 examples of the 10-seat twinjet have been delivered, according to Flightglobal's Ascend Fleets database.

The Honeywell HTF7350-powered aircraft is an upgraded version of the Challenger 300, which holds the record as the best-selling super-midsize type, with more than 450 units delivered during its decade in service. The last aircraft was handed over in the second quarter of 2014. ■



Bombardier

**The super-midsize Challenger 350 entered service in 2014**




Tecnam

**Power is supplied by a pair of 350hp Lycoming engines**

DEVELOPMENT KATE SARSFIELD LONDON

# Traveller near journey's end

Tecnam says majority of design work for its first commercial piston-twin is now complete

Italian airframer Tecnam has entered the detailed design phase for its P2012 Traveller and plans to roll-out the 11-seat piston-twin early next year.

"The toughest part of the design process is already complete," says chief executive Paolo Pascale. "The aircraft is scheduled to make its maiden flight in June 2016," leading to certification and serivce entry in the following year.

Tecnam is building a dedicated production facility for the high-wing aircraft at its headquarters in Capua, near Naples, which should be finished by year-end.

The Traveller programme is a departure for Tecnam, whose line-up comprises mainly light single-engined designs, aimed at the owner-flyer, training, and special-mission markets.

Tecnam – the largest producer of light sport aircraft globally – has partnered with US regional carrier Cape Air to help it define the requirements to properly address the segment.

The Hyannis, Massachusetts-based operator is the biggest commuter airline in the USA, with an ageing fleet of more than 80 out-of-production Cessna 402 piston twins, which it is looking to replace.

"Cape Air has been involved since day zero," Pascale says. "Its experience as a heavy user [of commercial aircraft], combined with our experience in aircraft manufacturing, is helping to create the next generation of piston transport aircraft that will benefit both the operator and the passenger."

Pascale adds that the partners are entering a segment of the aviation market that has been forgotten, "maybe even neglected" by the major aircraft manufacturers. "It has been more than 40 years since a new design was launched in the [6- to 10-seat] Federal Aviation Regulation Part 23 aircraft piston-twin aircraft category," he says. "There is an urgent requirement for a new, small commuter aircraft in this market."

Tecnam has received several letters of intent for the $2 million Traveller, which it will shortly convert into firm orders and begin assigning production slots to the position holders.

The aircraft will be powered by two 350hp (261kW) Lycoming TEO-540-A1A engines, which can be fuelled by avgas or mogas.

Other features include fixed landing gear – allowing it to operate from unpaved runways – short take-off and landing capability, large panoramic windows and four doors, including a sliding passenger door and a cargo door.

The Traveller is projected to have a maximum take-off weight of 3,290kg (7,250lb), a maximum cruise speed of 210kt (390km/h) at 8,000ft and a long-range cruise speed of 170kt. ■

REBRANDING KATE SARSFIELD LONDON

# Gama renames charter subsidiaries

Gama Aviation is rebranding its UK-headquartered business aviation services subsidiaries Hangar8 and JetClub in a move designed to streamline its global operations under a unified identity.

"Moving towards a single brand allows us to deliver a recognisable service standard across the world," says Gama chief marketing officer Duncan Daines.

"Strategically, this is important, as we believe the market requires scale, breadth and depth, driven through a singular focus that is unencumbered by managing multiple brands or service styles," he adds.

JetClub was already owned by Hangar8 when 33-year-old Gama snapped up the charter and management company late last year. Farnborough-headquartered Gama is one of the world's largest business aviation service providers, with a global fleet of 145 owned and managed aircraft. ■



Airbus lauds lack of breakthroughs
NEWS FOCUS P21

**MEMBERSHIP** **KATE SARSFIELD** LONDON

# VIP airline Beacon selects Dynamic operating partner

Aviation services provider to run fleet of King Air B200s and 1900s for members-only carrier

US members-only VIP airline Beacon is planning to launch services at the end of the third quarter and has selected US business aviation services provider Dynamic Aviation as its operating partner.

As part of a $400 million contract, Dynamic will acquire, operate and maintain a fleet of 27 pre-owned Beechcraft King Air B200s and 1900s on behalf of Beacon for a 10-year period. The twin-engined turboprops will be added to the fleet over the next three years.

"We will launch services with Dynamic's aircraft and then begin adding the King Airs at the end of the year," says Wade Eyerly, co-founder and chief executive of Beacon.

The airline's decision to acquire used King Airs rather than new aircraft was due to the sizeable inventory of low-time, good-quality models available, it says.

"It makes sense to buy them second-hand rather than new," says Eyerly, who is also co-founder of Pilatus PC-12NG-based members-only operator Surf Air. "We don't have any choice with the 1900s [which went out of production in 2002]," he says. "But these aircraft will have to be reconfigured into a nine-seat executive layout."

Beacon will initially offer regular services between White Plains, New York, and Boston Logan. "We are looking to attract high-frequency, high-end travellers who are fed up with time-consuming airlines and airports and want to put valuable hours back into their lives," Eyerly says.

"By operating from dedicated business aviation terminals, we can cut travel times between these two cities from around 4h to just over an hour," he continues.

Beacon plans to expand its network, with Washington DC and Philadelphia the likely locations. "The 27 aircraft will be enough to accommodate demand on these routes," adds Eyerly.

Beacon members pay a $1,000 joining fee followed by a monthly subscription of $2,000. For that they get unlimited travel between the two cities, although each customer is limited to four reservations at the same time.

Eyerly is confident Beacon's members will not treat the service "like an all-you-can-eat buffet".

"They won't want to make any more flights than they do now," he says, drawing a parallel with domestic appliances. "You have a washing machine because it saves doing everything by hand. But you don't use it all the time." ■



Textron Aviation

**Beacon chose the B200 due to its large second-hand inventory**



Viking Air

**Twin Otter sales remain brisk**

**GROWTH**

## Viking expands dealership and sales network

Canada's Viking Air is strengthening its 18-strong worldwide dealer network for its Twin Otter Series 400 with the appointment of new representatives and sales territories.

US business aircraft dealership Fenix Aviation will promote the twin-engined turboprop in Central and South America, including Belize, El Salvador, Nicaragua, Costa Rica and French Guiana. Bogota-headquartered charter company Searca will sell and support the Series 400 in Colombia.

Meanwhile, Nigeria's SkyJet Aviation Services has expanded its sales territory to include the Caribbean. The Kaduna-headquartered company already represents Viking in sub-Saharan Africa, Libya, Egypt, the Seychelles and the Maldives.

Viking has notched up around 150 orders for the modernised version of the de Havilland Canada DHC-6 since launching the programme in 2007. ■

**HANDOVER** **KATE SARSFIELD** LONDON

# PlaneSense adds first Nextant 400XTi light twin

Nextant Aerospace has handed over the first 400XTi to US fractional ownership company PlaneSense, bringing total deliveries of its remanufactured and re-engined Beechjet/Hawker 400A/XP business jet – introduced in 2011 – to nearly 60.

PlaneSense will incorporate the light twin into its fleet before the end of the month. This is the first aircraft from an order for up to five 400XTis, placed by the Portsmouth, New Hampshire-based company in March. The second unit is scheduled for delivery later this year.

The $5.3 million 400XTi marks PlaneSense's first foray into the business jet and multi-engine market. Until now, it has operated only Pilatus PC-12 single-engined turboprops, for which it is the biggest customer in the world, with a fleet of 32 of the seven-seat VIP-configured type.

Unlike the PC-12s, the 400XTi will not be split into fractions, but added to the core fleet and used by owners who need to travel longer distances than the PC-12 will allow, PlaneSense says.

The company is also launch customer for Pilatus's in-development light business jet, the PC-24, with an order for six examples. The first aircraft is scheduled for delivery in 2017.

Meanwhile, Nextant is hoping to secure certification for its G90XT – a remanufactured and re-engined Beechcraft King Air C90 – in the fourth quarter. Deliveries of the $2.75 million aircraft will begin soon after.

The Cleveland, Ohio-based company is now evaluating its next product and has set its sights on aircraft in the super midsize to long-range sectors, including the Dassault Falcon 50/2000/900 families and the Bombardier Challenger 600 series. A programme could be launched as soon as November's NBAA convention in Las Vegas. ■

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Three pillars to support Yeovil's future
NEWS FOCUS P23

**RESEARCH** **DOMINIC PERRY** DONAUWÖRTH

# Airbus lauds lack of breakthroughs

Rotorcraft manufacturer's latest technology demonstrator is a series of small steps forward, rather than a giant leap

"Maybe the biggest breakthrough is that there is no breakthrough."

An odd choice of words with which to unveil your new technology demonstrator, perhaps, but for Airbus Helicopters chief technical officer Jean-Brice Dumont, that is very much the point.

None of the basket of technologies – "techno-bricks", he calls them – utilised on the airframer's Bluecopter rotorcraft, unveiled on 7 July, are particularly cutting-edge, but each has been optimised to bring an incremental improvement to its performance.

And even the change that will inevitably attract the most interest – single-engine operation – is, says Dumont "not an invention".

"We are just bringing what was done previously closer to something that can be certificated on products," he says.

SEO, he says, is relatively commonplace among military pilots, who may occasionally shut down one powerplant as a fuel-saving measure on certain missions.

The airframer's eventual goal is to automate the system so that in certain conditions one engine will be shut down automatically once the mode is selected. Dumont likens it to the "eco button" seen on many cars and suggests that it could offer fuel-burn savings in the order of 25%.

## ADDING INTELLIGENCE

So the innovation, he says, is adding "intelligence" to the system to automate it in order to maintain safety, particularly around the restart of the second turboshaft.

Or as chief test pilot Volker Bau puts it: "If there's an emergency, we need that second engine very, very fast.

"How do we bring it up very fast and, finally, how do we do that automatically?"

Marius Bebesel, programme manager research and innovation at the airframer, says the shut-down engine can be restarted within 20-30s using the regular starter generator, but other options are available. "It is a question of what we would like to have," he says.

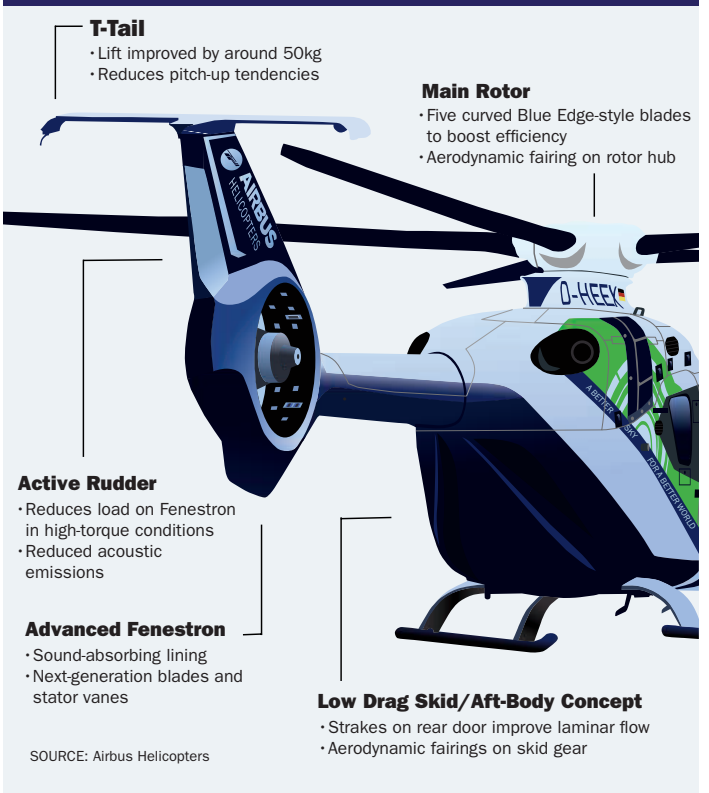
He alludes to research carried out using pressurised air that has enabled restart within 5s, or the possibility of using a more powerful starter generator. "But there would be some impact on weight and cost. There is a trade-off."

Besides, says Dumont, "customers will not opt for the luxury version, they just want to have an eco button".

**"Some technologies have a limit, others are transferable – it is very much a catalogue"**

**JEAN-BRICE DUMONT**
Chief technical officer, Airbus Helicopters

**DETAILS OF BLUECOPTER INITIATIVES**




SOURCE: Airbus Helicopters

Work on modifying the engine control system to enable the change has been performed in conjunction with Pratt & Whitney Canada, whose PW206B2 turboshafts power the prototype.

## EXCLUSIVITY

It is, in theory, a modification that could be employed on any twin-engined rotorcraft, by any engine manufacturer, but at present Airbus Helicopters has an exclusivity agreement in place with P&WC, says Dumont. But he acknowledges that, in the longer term, the concept could become more widespread.

Testing – and automation – of the SEO system will take place during the course of the coming months as the manufacturer embarks on a second phase of test flights using the heavily modified H135 prototype.

Its eventual goal on the programme, which is largely self-funded but also draws on finance from Germany's LuFo-IV research initiative and the European Clean Sky project, is to cut fuel consumption by as much as 40% and reduce noise by 10dB.

As the majority of the "bricks" are platform-agnostic, they could be employed on virtually any helicopter in the airframer's line-up, says Dumont – the exception being the size-limited Fenestron shrouded tail rotor.

He says the enhancements are at technology readiness level 6. "So they are ready for development, and then it is up to us which we pick and on which aircraft we install them. Some have a limit, others are transferable – it is very much a catalogue."

## ROAD MAP

With two programmes, the H160 and X6, currently in varying stages of development, Airbus Helicopters "will take [its] time" to analyse the results of the second flight-test effort that will conclude later this year "unless we find there is an immediate effect we can take on board with these developments", says Dumont.

"We have a bit of time to see the best road map," he says, acknowledging that some will feed into the two-year concept studies that are ongoing for its new X6 heavy rotorcraft.

The likely commercialisation of much of the technology that is fitted to the Bluecopter does appear to mark a change, however. Whereas previous demonstration efforts – the X3 high-speed rotorcraft, hybrid engines, and optionally piloted systems, for example – appeared almost an end in themselves, Airbus Helicopters seems much more commercially focused this time around.

Dumont points out that the X3 was a technological breakthrough, "a high step" to reach, whereas with Bluecopter it is different.

"I believe in it much more because we have a more manageable set of bricks," he says. ■

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Westland links
PICTURE SPECIAL P24

**STRATEGY** **DOMINIC PERRY** YEOVIL

# Three pillars to support Yeovil's future

As UK defence spending slows, AgustaWestland is adapting plant's capabilities, but government support is still required

Despite its proud aeronautical heritage, the UK has only one aircraft manufacturer that has been in continuous production for 100 years.

The perhaps unlikely holder of that title is Westland. Although for some people it is simply a suffix to Italy's Agusta, the firm continues to assemble aircraft at its Yeovil facility in southwest England.

It began aircraft manufacture in 1915, building Short Brothers Type 184 seaplanes for the British Admiralty. Other notable fixed-wing types were assembled at Yeovil, including the Vickers Vimy, Supermarine Spitfire and Seafire, and Westland Lysander.

However, in 1946 the company made the decision to switch to making helicopters – the product for which it became synonymous.

Since its first rotary-wing type arrived in the early 1950s – the Westland Dragonfly, a licence-built version of the Sikorsky S-51 – the Yeovil site has delivered around 3,000 helicopters.




Dominic Perry/Flightglobal

**The factory's newest assembly line is building the search and rescue variant of the AW189**

## FINISHED LINES

But assembly work at the plant is now largely confined to two key models – the AW101 and the AW159 – with a smaller line devoted to the search and rescue (SAR) variant of the new AW189.

Although additional work has been generated through maintenance, overhaul and upgrade contracts with the UK Ministry of Defence, there is the lingering question over the long-term future of Yeovil. Or to put it another way – for how many years of its second century will aircraft manufacturing continue?

For instance, assembly of the AW159 – also known as the Lynx Wildcat – for the British Army and UK Royal Navy, and for South Korea's navy, is about halfway through the combined 70-unit total. Production is guaranteed until mid-2017. After that it relies on AgustaWestland securing more of the so-far-elusive export deals.

"We have a contract with Korea, as well as other countries that may be coming," chief executive Daniele Romiti told journalists at a 12 July event to celebrate the company's centenary.

The short- to-medium-term outlook for the 15t AW101 is a little brighter, however. In late 2013 Norway signed as a customer, with an initial deal for 16 SAR-roled helicopters and six options.

Oslo's first AW101 is on the line at Yeovil, with a second to enter final assembly in the coming weeks. Deliveries are scheduled to run from 2017 to 2020, and Romiti says Norway is "very happy with how the programme is moving", with the nation's minister of the interior having recently visited the plant.

Deliveries of the SAR-configured AW189s, meanwhile, are scheduled to run until 2017 and total 12 units: 10 for Bristow Helicopters and two for AAR Airlift for use in the Falkland Islands.

Although other long-term opportunities for the Yeovil factory exist – potential assembly work on Boeing AH-64E Apaches later this decade, and an idea mooted by Romiti for a new joint Anglo-Italian military development for the mid-2020s – AgustaWestland is clearly hedging its bets.

"An assembly line is one element of industrial capability, but it's not the only one," says Romiti.

"The companies [Agusta and Westland] are now so integrated that many components from Yeovil are coming into Italian models."

The growth of the facility's design capabilities can be seen on the new AW169 medium twin, where Yeovil has contributed extensively to the helicopter's transmission and rotor system. In addition, it is becoming a centre of excellence for tiltrotor development.

## ROTOR HUB

Although the AW609 civil tiltrotor is yet to enter service – that milestone is scheduled for 2018 – the airframer is already working on a larger second-generation version under the EU's Clean Sky 2 programme with capacity for up to 24 passengers. As part of this effort, Yeovil is providing engineering expertise for the type's prop-rotor blades and hubs.

Romiti describes Yeovil as having three pillars supporting its future: military, civil, and exports. Success in the latter field, he notes, could be improved if the company were able to take advantage of the same level of support as its rivals across the Atlantic enjoy via the US Foreign Military Sales (FMS) mechanism.

He has already delivered that message to the UK's trade and industry minister Francis Maude. "I emphasised that we need the support of the British system. FMS is a very powerful tool. To have something similar would not give us any favours, but it is about not being penalised whenever we have to compete with US products," he says.

Italy's government is already considering something similar for government-to-government sales and overall the UK administration's "attitude is positive".

In the long term, it appears to rest on the UK government to decide what kind of industrial capability it wants the nation to have. As Romiti points out, AgustaWestland is one of only six or seven large-scale helicopter manufacturers in the world. "Being among the seven is something that is difficult to build, but easy to destroy," he says. ■

**See Picture Special P24**

# WESTLAND LINKS

To celebrate a century of continuous aircraft production, one of the stalwarts of the UK aerospace industry opened its doors to the public on 12 July. Visitors were free to roam production lines and were treated to displays of Yeovil-built aircraft both old and new














**(*Clockwise from main*) AW609 tiltotor; Royal Navy Wasp; retiring RAF Sea King HAR3 and Whirlwind; Sea King HU5 joins the club; 'stringbag' Fairey Swordfish; Spitfire crew ready for Jerry; rotary line-up; Seafire starts; Lynx AH7; AW189 nose; Sea King ASaC 7 has bags of class; AW189 is SAR of the show**

Dominic Perry/Flightglobal, VLN Photography


HMS
ENDURANCE


XJ729
ROYAL AIR FORCE
RESCUE


AW609









# HIGHER EDUCATION

After a troubled introduction, the RAF's new Hawk T2s are preparing skilled pilots for the frontline, and proving that a partnered approach to training can deliver success




**CRAIG HOYLE** RAF VALLEY

Fifteen years ago, the UK National Audit Office (NAO) published a report on the Ministry of Defence's ageing military flying training infrastructure that was so damning it acted as a wake-up call for the services, and prompted a wholesale modernisation.

In essence, the process of training new pilots and other aircrew for the air force, army and navy was too slow and too expensive, and was failing to deliver sufficient personnel capable of performing frontline tasks. In the fast jet sector, pilots were arriving at their operational conversion units still requiring costly additional instruction on expensive platforms.

Partly as a result of the publication of *Training New Pilots*, the MoD went on to launch the UK Military Flying Training System (MFTS) concept. For this, it would employ a so-called training system partner to create and run a new framework capable of meeting its annual throughput requirements and – crucially – its output standards.

In 2008, the MoD signed a 25-year contract with Ascent Flight Training – a joint venture between Lockheed Martin and Babcock International – kicking off a transformation that will continue through the rest of this decade.

A commitment for new advanced jet trainers (AJT) had been made in late 2006, when the MoD contracted BAE Systems to manufacture a fleet of 28 Hawk T2s. Deliveries of the new model – which brings a major advance in capability over the 1970s-vintage T1 that shares its name – commenced in 2009, to the Royal Air Force's Valley training base on the Isle of Anglesey in north Wales.

## CAPACITY

Today, the circuit at Valley is busy with T2s assigned to 4 Sqn, while a last unit of Hawk T1s is also currently scheduled to remain active with the RAF's 208 Sqn until December 2017. The latter typically has 12 aircraft on the ramp, with nine or 10 of these being flown per day. Annual capacity is for 15 ab initio students and the provision of 30 refresher courses, with around 17 instructors delivering these, says Wg Cdr Chris Kidd, its officer commanding.


Paul Heasman

**A total of 24 pilots will train on the new model this year, rising to 36 a year when the T1 is retired**

Between them, the Hawks new and old deliver the advanced jet training syllabus for RAF and Royal Navy pilots, with some capacity for international students including recent graduates from Kuwait and Saudi Arabia.

Some two years after the UK's first ab initio students completed their training on the Hawk T2, *Flight International* was invited to assess the health of the growing MFTS infrastructure – and given the opportunity to fly with 4 Sqn.

The visit occurred just two weeks after the NAO had released a new report, entitled *Military Flying Training*. This report raised concerns about the introduction of the new model, with criticism of some aspects of Ascent's performance between contract award and 2012. Some courseware developed by the company was deemed "not fit for purpose", and there were "concerns about cost and schedule control, the quality of core [training] provision, and governance and leadership within the Ascent team", the document says.

Paul Livingston – who became managing director at Ascent in January 2014, after Lock-



Valley-based 4 Sqn flies 28 Hawk T2s in the OC2 standard

Paul Heasman

heed colleague Jim Keeler had steadied the ship – acknowledges initial shortcomings, saying Ascent should have better anticipated the challenges of establishing such a capability. But things have picked up markedly, he adds.

This opinion is backed up the NAO's recent findings. "Since early 2012, Ascent has improved its performance [and the MoD] has noted an improvement in the quality of its work and a more constructive working relationship with the project team and the Royal Air Force," it says.

## INVENTORY

Several key elements of the eventual MFTS model have yet to be introduced, with a contract still pending to replace the remainder of the fixed-wing training inventory with a trio of new types (*see P32*). These will join the Hawk T2s and four Ascent-provided – but MoD-owned – Beechcraft King Air 350ER Avengers, currently used to provide observer training for the RN's Fleet Air Arm from RNAS Culdrose in Cornwall under the programme's rear crew training stage one element. A contract to adapt the latter type to deliver a stage two rear crew training capability is expected during 2016.

A previous schedule to field a new generation of training helicopters was delayed earlier this decade, with the RAF, RN and British Army temporarily making further use of the Defence Helicopter Flying School (DHFS) service. A replacement capability for its Cobham-provided fleets of Airbus Helicopters AS350 Squirrel HT1s and Bell Helicopter 412EP HT1s will achieve initial course capability on 1 April 2018, with two bids still being assessed by Ascent.

The NAO is, however, concerned about introducing potentially five new aircraft types to service in just over three years, noting: "The department may not have enough time and staff to certify all of the new core training aircraft in time for the planned start of training."

"It's doable – we have solid plans and are well-rehearsed," counters Livingston. Richard Murray, integrated project team leader for MFTS at the MoD's Defence Equipment and Support (DE&S) organisation, describes the balance of achieving certification for the new types while simultaneously running down the MoD's legacy training fleets as a "joint headache".

**"The cost of the programme has fallen, but the quality is going to go up"**

**PAUL LIVINGSTON**
Managing director, Ascent Flight Training

## EFFICIENCIES

When Ascent began delivering training in 2011, the MFTS programme had a forecast lifetime cost of £6.8 billion ($10.6 billion). But major cuts to the MoD's frontline needs, driven by the Strategic Defence and Security Review of late the previous year, has seen this fall to a current expectation of £3.2 billion by 2033. This largely reflects a shift from a previous expectation to train 480 aircrew per year to just 250: around 150 pilots and 100 rear-crew members.

Murray notes that efficiencies have also been found. For example, as contract signatures for the future fixed-wing and rotary fleets will be made later than previously planned – but with the programme still due to run until only 2033 – savings are possible.

"I'm confident on all of the core objectives," says Livingston. "The cost of the programme has fallen, but the quality is going to go up and expand through the other platforms."



The Moran Building at Valley has two full-mission simulators, and 45% of the course is synthetic

Lockheed Martin

**"We have had interest from around the world, and many are envious of our system"**

**WG CDR PAUL MOUNSEY**
Officer commanding, 4 Sqn

In addition to sourcing the new aircraft, Ascent must provide facilities, courseware, simulators and instructors, he says. "We have a defined output per year and the syllabus is set against that – we know how many hours a day, how many waves and can anticipate peaks."

A "peak" was seen last year, when the rest of the Avenger fleet had to be flown more intensively for several months after one of the King Airs was damaged during a wingtip strike.

After a troubled start, throughput on the Hawk T2 is increasing steadily. The 17th course of students arrived early this month, while a ninth course for instructors is under way. The first students entered the new AJT system in April 2012, and by May 22 ab intio students had completed their training on the type, according to the DE&S.

A total of 24 pilots will train on the new model this year, with this number to increase to 36 following the disbandment of 208 Sqn.




Merion Williams

**Our flight opportunity including taking ZK010 through the "Mach Loop" in Wales**

Referring to the previous gap between legacy training aircraft cockpits and advanced types like the Eurofighter Typhoon, officer commanding 4 Sqn, Wg Cdr Paul Mounsey, notes: "The big thing was bridging that gap and making our training more relevant. It's the advanced avionics that set this aircraft apart."

One example of this is the T2's ability to emulate the use of a radar combined with Raytheon AIM-120 AMRAAM medium-range air-to-air missiles. Students perform 15 synthetic radar rides before using the technology in the air, says Ascent instructor Gary Brough. Such an approach "ensures a much higher success rate," he adds.

Overall, around 55% of the Hawk T2 training course is delivered using live flying, with the remainder being synthetic. The Moran Building at Valley contains two full-mission simulators, six flight-training devices, 10 desktop trainers and other computer-based training equipment and personal learning devices.

"Previously, it was all about getting numbers to the frontline – now it's written around

SORTIE

## ADVANCED CAPABILITIES HELP HAWK T2 CLOSE TRAINING GAP TO TYPHOON

MY SORTIE with the Royal Air Force's 4 Sqn was conducted from its Valley training base on the Isle of Anglesey, north Wales on 1 July, with BAE Systems Hawk T2 ZK010 flying as "Victor 95".

The aircraft was available in the configuration used during the advanced weapons unit course, with a centreline fuel tank installed for extended endurance and wing-tip-mounted seekers from the Raytheon AIM-9L Sidewinder air-to-air missile to support emulated weapons use.

Twenty of the RAF's 28 Hawk T2s were on the flightline, with three in depth maintenance and the others having faults rectified – including one that had suffered a birdstrike to its nose the previous day.

Following our take-off using runway 13, we routed towards Liverpool to perform a practice diversion to John Lennon International airport. This enabled me to familiarise myself with the Hawk's new-generation cockpit, which in the back seat (ordinarily occupied by an instructor) includes a head-up display repeater on its middle (upper) of three multi-function displays.



Craig Hoyle/Flightglobal

**Rear cockpit display functionality is akin to a fighter platform**

The others showed traffic collision avoidance system (TCAS) data and a moving map.

As a single-ship flight, there was no opportunity to demonstrate the T2's Hawk-to-Hawk datalink in operation so, after transiting back through Wales, my pilot, Flt Lt Alasdair Spence – who had combat experience flying the Panavia Tornado GR4 – made two runs through the "Mach Loop", a favoured spot for low-level training.

Spence says that the area's challenges for 4 Sqn's students can be enhanced greatly by the introduction of electronic warfare threats such as emulated surface-to-air missile systems, but the high-*g* turns were arduous enough for a novice passenger.

Following a brief spell of general handling conducted at medium altitude, we returned to Valley, joining the circuit and performing a touch and go landing before completing a flight lasting 1h 5min.

My impression of the aircraft was that the range of advanced capabilities introduced with the current fleet-wide OC2 operating standard will heighten the situational awareness of student pilots compared with the legacy Hawk T1's analogue instrumentation. The introduction of TCAS, a ground proximity warning system, and full authority digital engine control software has also moved the T2 a generation ahead in terms of its operating safety.

While the RAF's Eurofighter Typhoon is often described as flying "like a big Hawk", the T2's embedded training equipment means that the type can now truly operate like a "little Typhoon", and effectively prepare new pilots for the frontline. ■


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Paul Heasman

**A role demonstration performed by a pair of Hawk T2s showcases 4 Sqn's ability to prepare new pilots for a range of combat scenarios**

» the student," says Ascent station manager Meirion Roscoe, himself a former RAF qualified flying instructor (QFI). "We are arguably world-leading," Mounsey adds. "We have had a lot of interest from around the world, and a lot of nations are envious of our system."

## INSTRUCTORS

Exchange posts have been taken by pilots from France, South Africa and the US Marine Corps, with a QFI from Canada to start flying the type in September followed by a Belgian air force pilot during 2016. One Qatar Emiri Air Force pilot is also now flying the aircraft, via the UK's international defence training mechanism, and Saudi Arabian personnel are due to commence instruction soon, potentially followed by Kuwaitis. However, Livingston says MFTS has been set up purely to meet national requirements, and to be as "taut as possible".

"At the moment we're not maximizing all availability – but we will in two to three years," Murray says of the T2 inventory's rate of use.

The UK military provides all QFIs for the Hawk T2, while Ascent employees deliver ground-based training. The UK's dramatically-reduced squadron numbers produced a challenge in maintaining enough instructors, and a shortage of such personnel led to a mutually-agreed training pause and resetting of the programme more than two years ago.

"T2 instructors are very hard to find," says Roscoe. Future options could include using fewer QFIs, or tempting those about to leave the services to extend by a further tour as sponsored reservists, to share their experience.

"We have a world-class system here, but we could do more," says Mounsey.

Other activities could include taking night vision goggle training work from the Typhoon operational conversion unit, for example. The platform costs one-fifteenth as much to operate, but is not currently used to provide night-time instruction.

Other tasks that could in theory be "downloaded" in this way could include practicing formation behind a tanker, training in the suppression of enemy air defences and in using advanced precision-strike weapons such as MBDA's Storm Shadow cruise missile.

Such activities could enable a new pilot to achieve limited combat ready status on the Typhoon after perhaps performing only 10 simulator flights and five live flights on the combat aircraft – significantly reducing time and cost.

"We need to be slightly bolder and take a little more risk," says Air Vice-Marshal Andrew Turner, air officer commanding the RAF's 22 Group training organisation. Saying that the system is today "still in replicate mode, rather than innovate," he adds: "it was a wrong time to be bold a couple of years ago – but now we understand the risk and the partner better."



Paul Heasman

**The syllabus and system are world-leading**

> **"We have a common goal [at RAF Valley] – to train world-class fighter pilots"**
>
> **MEIRION ROSCOE**
> Ascent station manager

Using the breadth of its new MFTS equipment, Turner believes the UK will be able to "deliver top-end, total role conversion – so nothing's new; just the airframe."

To showcase its current abilities more widely, a pair of 4 Sqn's aircraft will conduct a new role demonstration for the first time at the Royal International Air Tattoo at RAF Fairford in Gloucestershire from 17-19 July.

"We have a common goal – to train world-class fighter pilots," says Roscoe. "This system cannot run with efficiency if we don't partner." Reflecting this, Ascent's branding is now far less prominent on courseware, for example, than earlier in the programme. "Partnering gets better when you all feel linked to the squadron and the squadron identity," Livingston notes.

"We are now mature operators of the T2, and have an advanced syllabus," says Mounsey. Reflecting on the completion of his own training at Valley 18 years ago, he notes: "The guys leaving here are hands-down better prepared for the frontline than I was." ■




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A fleet of 10 Beechcraft T-6C Texan II turboprops will be used for BFT tasks

Beechcraft

# TIME FOR CHANGE

With fewer aircrew required by its armed forces, the UK's replacement fixed-wing training fleet must be smaller but smarter, and make increased use of simulation

**CRAIG HOYLE** LONDON

With the remainder of the UK Military Flying Training System's (MFTS) new aircraft to enter operational use before the end of the current decade, the selection of low-risk types is a critical factor in the project's success, says Ascent Flight Training managing director Paul Livingston.

Three more fixed-wing types will be joining the already-operational 28 BAE Systems Hawk T2s and four Beechcraft King Air 350ER Avengers in use as part of the MFTS infrastructure.

Following the October 2014 selection of a solution offered by Elbit Systems/KBR joint venture Affinity, Grob Aircraft's turboprop-powered G120TP will provide the future elementary flying training element of the MFTS syllabus. The company will be contracted to produce 23 of the side-by-side-configuration type for the UK.

To be flown from the Royal Air Force's Barkston Heath and Cranwell bases in Lincolnshire, the new assets will replace a current core fleet of 40 Grob G115 Tutors. Initial course capability is scheduled for early in 2018.



Grob Aircraft

Grob G120TPs will cover elementary flying

Selection of the glass cockpit-equipped G120TP for the UK strengthens the German manufacturer's order book, from a combined 79 for Argentina, Indonesia, Mexico and Myanmar. CAE USA will also get six, for use as part of a new system to screen fixed-wing pilots for the US Army and US Air Force.

## TRANSFERRED TASKS

Basic flying training (BFT) tasks – currently delivered using 40 Shorts Tucano T1s – will be transferred to a fleet of 10 Beechcraft T-6C Texan IIs. These will be flown from RAF Valley on the Isle of Anglesey in north Wales, which is already the home of the service's Hawk T2s and older Hawk T1s. The new turboprops will be supported by ground-based training equipment, including one full-mission simulator.

While the proposed small fleet size has raised some eyebrows, officials from Ascent,

| UK FLYING TRAINING TRANSITION | | |
|---|---|---|
| **Elementary flying training** | **Grob 115** | **G120TP** |
| Number | 40 | 23 |
| Annual flying hours* | 15,058 | 12,861 |
| Simulated training | 0% | 35% |
| Military instructors | 44 | 35 |
| Civilian instructors | 17 | 23 |
| **Basic flying training** | **Tucano T1** | **T-6C** |
| Number | 40 | 10 |
| Annual flying hours* | 7,500 | 5,142 |
| Simulated training | 33% | 46% |
| Military instructors | 48 | 15 |
| Civilian instructors | 1 | 5 |
| **Multi-engine training** | **King Air 200** | **Phenom 100** |
| Number | 7 | 5 |
| Annual flying hours* | 5,000 | 3,305 |
| Simulated training | 35% | 58% |
| Military instructors | 25 | 14 |
| Civilian instructors | 0 | 6 |

NOTE: *(live) SOURCE: Ministry of Defence

the RAF's 22 Group and the UK's Defence Equipment and Support (DE&S) organisation are confident in the numbers. These include a roughly 30% reduction in total live flying hours during the BFT phase, and an increase in the use of simulated instruction to 46%.

A dynamic pipeline model, which is independently assured and also assessed by the MoD, is used to support such through-life projections of required aircraft numbers.

"Ten Texans with an availability rate of over 90% – it's unheard of," says Richard Murray, MFTS integrated project team leader for the DE&S, comparing the future fleet against the ailing Tucano.

## STRICT PENALTIES

"I'm confident we've got the right number," says Livingston, adding: "the penalties for not meeting it [the required output] are strict."

This confidence in the Beechcraft model's performance is backed up by the company's delivery to date of more than 850 T-6-series trainers, and the accumulation of over 2.5 million in-service flight hours. Notably, this installed fleet includes 17 A-model examples made available to the Israeli air force via an Elbit-delivered training system.

Initial capability with the T-6C is due in January 2019, with full availability to be declared in December the same year. At this point, the entire MFTS infrastructure will be in place.

Unlike the types they will be replacing, the G120TP and T-6C feature digital cockpits, which will expose students at an early stage to the technologies they will rely on at the operational level.

The remaining fixed-wing element of MFTS will deliver multi-engine training from June 2018 using five Embraer Phenom 100 business jets operated from RAF Cranwell. These will assume the training service currently being delivered using a leased fleet of seven King Air 200s. Selection of the Phenom 100 represents the first time that the twin-engined type has been picked to deliver military training, and Murray says this will require a number of minor modifications to be certificated.

Flightglobal's Ascend Fleets database lists 324 of the Brazilian-built Phenom 100 as in use around the globe currently, with a further 222 of the type on order.

Contract signature with Affinity is planned to occur late during the third quarter of this year, having been delayed from a previous goal of March. ■



Embraer

**Embraer Phenom 100 business jets will replace King Air 200s for multi-engine training**

ROTORCRAFT

## AIRBUS AND COBHAM PREPARE FINAL OFFERS

TWO BIDDERS remain in contention for the UK Military Flying Training System's rotary element. This follows the elimination of a third contender: an Elbit Systems-led team, which had been pitching the Bell Helicopter 407.

*Flight International* has previously reported that Airbus Helicopters UK is promoting the H135 and H145 light and medium twins, while Cobham – the incumbent provider of the current Defence Helicopter Flying School (DHFS) service – is offering AgustaWestland's skid-equipped AW109 Trekker, and possibly also the AW169.

The aircraft that are eventually selected will replace fleets of Airbus Helicopters AS350 Squirrel HT1s and Bell 412EP Griffin HT1s.

The new training aircraft will have full glass cockpits, which will allow them to be used to train pilots to fly frontline types including AgustaWestland's AW101 Merlin and Lynx Wildcat, Boeing's CH-47 Chinook and the Westland/Boeing AH-64 Apache AH1.

Final offers from both contenders are being prepared.

A preferred bidder selection by Lockheed Martin/Babcock International joint venture Ascent Flight Training is expected late this year, ahead of a so-called Main Gate investment decision targeted for late in the first quarter of 2016. Contract placement is expected shortly afterwards, says Ascent managing director Paul Livingston.

> **"You can't have joint-service capability without a single-service ethos"**
>
> **AVM ANDREW TURNER**
> AOC 22 Group, Royal Air Force

Initial course capability is to be declared at the Royal Air Force's Shawbury base in Shropshire on 1 April 2018, and since that target was agreed early last year Ascent "has not missed a single day on that schedule", Livingston says. Introduction of the new capability will be six years later than originally targeted, with the Ministry of Defence having opted to extend use of the current DHFS infrastructure to reduce costs in the wake of its Strategic Defence and Security Review of October 2010.

The UK National Audit Office values the continuation of the current system with Cobham at some £300 million ($470 million).

"The solutions that are on the table are really good – both of them are technically very capable," says Livingston, who declines to comment further, due to the competition stage.

Although the timeline from selection to service introduction is short, he notes: "We've done so much work on fixed-wing, we've been able to learn from experience and take some of that into the contracting for rotary."

Air Vice-Marshal Andrew Turner, air officer commanding the RAF's 22 Group training organisation, believes the future rotary system should retain the "joint flavour" but distinct multi-service feel of DHFS. "You can't have joint-service capability without a single-service ethos," he notes. ■

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## Long-haul helps Heathrow grow

Ascend chief economist Peter Morris doesn't explain why he thinks that Heathrow doesn't work as a hub with just long-haul routes (*Flight International*, 14-20 July).

Dubai seems to work rather well as a hub, predominantly providing connections between long-haul flights.

The fact that there are significantly fewer short-haul feeder flights at both Heathrow and Dubai, compared with typical European and North American hubs, means that the dominant airlines at these airports, such as BA and Emirates, are less exposed to price-based competition from lower-cost short-haul carriers – and, in the case of continental Europe in particular, other modes of transport such as high-speed rail. I would consider this an advantage.

Neither does Peter Morris offer any explanation why he thinks that having several competing airports serving London isn't a strength and why he views the city's airport system as the world's most inefficient.

While there certainly isn't any doubt about the effect of London's premier airport's capacity constraints on the number of destinations its airlines can serve – and the limited scope this provides for adding services to new markets, compared with rival airports that have greater spare capacity – an alternative interpretation of the analysis of airline schedules by Ascend's Henk Ombelet clearly shows that Heathrow has turned its single biggest handicap into an advantage. It has managed to keep ahead of its European rivals by offering far higher frequencies to its most popular long-haul destinations, such as New York.

It has been able to do this primarily because of London's far bigger origin and destination (O&D) market, which generates a lot more premium traffic. This makes it less dependent on generally less profitable transfer passengers, especially when compared with the much smaller O&D markets of Amsterdam and Frankfurt. This in turn gives BA far greater scope to choose to carry only profitable transfer passengers than, say, KLM or Lufthansa – and thereby exposes it less to competition from lower-cost rival hub-and-spoke operators, such as Turkish Airlines.

**Krishnan Iyengar**
*Crawley, West Sussex, UK*

SPACEFLIGHT

## No boost for air launch concept

The one major advancement in large space booster rockets that has never been implemented is air launch. No government or private sector entity has ever been willing to commit the money for development, which is why after 50 years we still see the same old ballistic missile concepts being recycled.



Rex Features

**Could air launch prevent disaster?**

I created some renderings in 1986, shortly after a conversation with legendary scientist John Stapp about the *Challenger* disaster.

In Stapp's estimation, accelerating the Space Shuttle to supersonic speed in the thickest part of the atmosphere introduced so much stress into the system that it was unlikely the fleet would survive long enough to accumulate even 100 missions. It was Stapp's aeromedical research in the 1950s that established the survivability of ejections at supersonic speed. I eventually learned from NASA they had studied the concept of air launching the shuttle. Their analysis showed that air launching the shuttle stack at 30,000ft at 400kt would cut the burn time of the solid boosters from 2min to 1min, reducing the weight of the stack by one million pounds – but the volume needed for the external tank would remain the same.

However, the NASA analysis did not take into account the benefits of reduced stress. In retrospect, Stapp's estimation of the lifespan of the shuttle fleet was just about right.

**Franklin Ratliff**
*via email*

## What's wrong with English?

There have been a number of letters recently complaining about the journalistic use of gobbledegook where normal words or phrases already exist.

In his article about the Boeing 777X (*Flight International,* 30 June-6 July), Stephen Trimble uses the expression "the width of the wheelbase" (of the main landing gear).

Doesn't the simple word "track" cover this? Or must we continue to suffer the continued creation of new words?

**Dudley Newis**
*Lytham St Annes, Lancashire, UK*

## Safety first

Is EASA finally applying its CS 25.772(c) regulation as intended and not influenced by the US Transportation Security Administration (*Flight International*, 7-13 July)?

Get rid of the "lock" position (and the mechanical lock in the 737) instead of implementing this hazardous "four eyes" concept.

**Charles Aufranc**
*Mont-sur-Rolle, Switzerland*

## Doors weighed

When is a door not a door (*Flight International,* 7-13 July)?

A statistical evaluation has to be made of the relative number of potential hijackers or other dangerous elements that are foreign to the flightdeck, in comparison with the number of potentially suicidal pilots. In the current climate I would consider the former the greater risk, so would like to see continuance of the secure flightdeck door, despite its obvious shortcoming.

**Richard Chandless**
*Crêches-sur-Saône, France*

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## Driving up the fear factor

The "slightly distasteful press release of the week" award goes to a certain car hire company with a special European-wide offer for "the 30% of people with aviophobia – the fear of flying – in order to save family summer holidays".

The release continues: "For the past year the news of high profile plane crashes and disappearing flights have dominated headlines worldwide. It is no wonder that many people are now too scared to fly all together. The Germanwings Airbus A320, en route from Barcelona to Düsseldorf, follows other high profile cases including Air France flight 447 in 2009 and Malaysia Airlines flights MH370 and MH17 last year."

Terrifying stuff, except for the fact that 25,700 people were killed on Europe's roads in 2014 (according to the European Commission). That's the equivalent of an A380 crashing every week. Okay, it's hard to weigh up the risk of boarding a Boeing at Heathrow against heading off to Tuscany in your Toyota, but some perspective please.

## Hexe-rated

Meet Hexe. She's the new mascot adorning the side of Airbus Helicopters' latest technology demonstrator, the Bluecopter, which was unveiled earlier this month in Donauwörth, Germany.

You see, Hexe is German for witch and the rotorcraft in question – the original prototype for the EC135 (now the H135) – bears the registration D-HEEX. The design originally featured a more Hansel and Gretel-style hag, but company insiders "wanted a more pin-up witch", apparently. We're not sure if that broomstick is EASA certificated, however.



Airbus Helicopters

**Broom for improvement**




AirTeamImages

**"When I grow up, I want to be a 747"**

## Goodbye Joey

So, it's farewell to G-JOEY, the Trislander with the smiling face that has been flying for Aurigny for almost 40 years.

The three-engined Britten-Norman piston – one of six being replaced with Dornier 228s – made its last of more than 91,000 flights for the Guernsey carrier on 28 June from Southampton to Guernsey, via Alderney. Painted with a face for Comic Relief in 1988, Joey became the symbol of the island airline, and has its own fan club, Twitter account, and Save Joey Facebook page. It is even the hero of a series of children's books.

Given the lack of suitable indoor space on the Channel Island, there is still some uncertainty over Joey's fate. The airline has posted on Facebook: "Rest assured that Aurigny are working to give Joey the best final resting place possible. The aircraft WILL be preserved, it's just a matter of where."

## On the offensive

Stewart Sidewinder, former offense – sorry defence – editor of this parish, detects yuckspeak in this extract from our 30 June-6 July issue: "Converts a mixture of fuel and air into energy through a simplified four-step process involving suction, compression, combustion and diffusion."

"So that's suck, squeeze, bang, blow, then?" asks Stewart.

## Taking a bullet

A United Airlines Boeing 767 was grounded at Munich after the captain admitted flushing 10 bullets down the toilet, reports avherald.com. En route from Houston, the pilot remembered he had the ammunition in his baggage. After initially disposing of the evidence in the waste bin, he opted for the lav instead, but then decided he should inform ground staff. Firefighters in protective clothing had the duty of "filtering" the waste tank to find the bullets. US pilots can carry guns on domestic flights and the captain may simply have forgotten to get rid of the bullets for the international trip.

It is not thought the captain will face charges, reports avherald.com. Happily it wasn't a 110ml bottle of mouthwash or a can of Coke he'd tried to smuggle on board…then he'd really have been in trouble.

## At the frontlines

**100 YEARS AGO**

In the communique issued in Paris, it was stated: "A squadron of six aeroplanes, on the morning of the 20th, bombarded the station at Colmar. Eight shells of 150 mm (6in) and three of 90 mm were launched upon the buildings, the rails, and the trains.

## Caproni bomber

**75 YEARS AGO**

At the Milan Aero Show in October, 1937, the Societa Italiana Caproni, of Milan, exhibited a new twin-engined bomber designated the Ca 135. It was then learned that an order for these machines was being executed for the Italian Air Force.

## Civil hovercraft

**50 YEARS AGO**

The potential of the marine hovercraft is that it offers the possibility of transporting large payloads over water at high speeds without the water disturbance and drag associated with displacement vessels. The air-cushion suspension system, by which this is achieved, is inherently capable of alleviating the unpleasant effects of travelling over irregular surfaces.

## Runway legacy

**25 YEARS AGO**

UK Transport Secretary Cecil Parkinson has set up a working party to consider economic and environmental issues raised in choosing the location for an additional runway in south-east England needed within the next 10 to 15 years.

**100-YEAR ARCHIVE**
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**Baltic Business Aviation Forum**
Jurmala, Latvia
bbaf.aero/en/

**25-30 August**
**MAKS**
Moscow, Russia
aviasalon.com

**15-16 September**
**Flight Safety Symposium**
London, UK
flightglobalevents.com/flightsafetysymposium2015

**15-18 September**
**DSEI 2015**
ExCel, London, UK
dsei.co.uk

**29-30 September**
**Aviation Partnership Summit**
Amsterdam, The Netherlands
flightglobalevents.com/APS15

**29-30 September**
**New Generation of Airline Passenger Systems**
London, UK
flightglobalevents.com/pss2015

**1 October**
**US Corporate Aviation Summit**
Fort Lauderdale, Florida
aeropodium.com/uscas

**1-2 October**
**Central Asian Aviation Symposium**
Almaty, Kazakhstan
aeropodium.com/caa

**6-8 October**
**Helitech International**
ExCel, London, UK
helitechevents.com

**20-21 October**
**The Commercial UAV Show**
ExCel, London, UK
terrapinn.com/exhibition/the-commercial-uav-show

**8-12 November**
**Dubai Airshow**
Dubai World Central
dubaiairshow.aero

**15-17 November**
**ALTA Airline Leaders Forum**
San Juan, Puerto Rico
alta.aero/airlineleaders/2015

**17-19 November**
**NBAA 2015**
Las Vegas, USA
nbaa.org/events/bace/2015

**17-19 November**
**Aerospace & Defense Meetings Torino**
Torino, Italy
bciaerospace.com/turin

**19-20 November**
**Safety In African Aviation**
Kigali, Rwanda
2gether4safety.org

**1-2 December**
**Military Airlift and Rapid Reaction Operations**
Seville, Spain
smi-online.co.uk/defence/europe

**8-10 December**
**Aerospace Meetings Brazil**
São Paulo, Brazil
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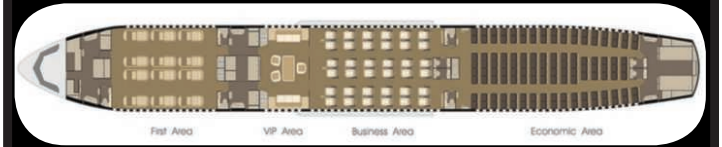


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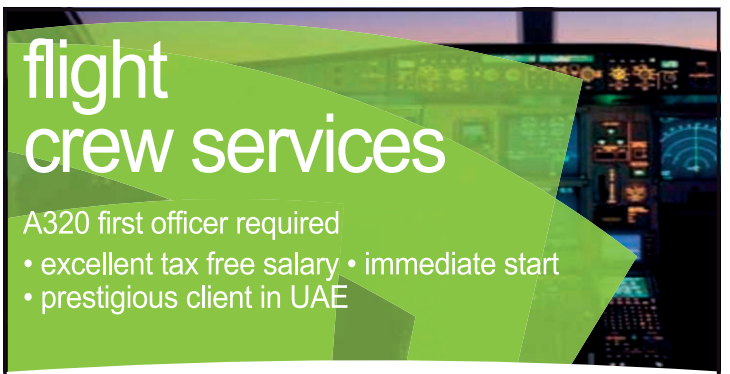
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## Senior Operations Officer (Senior Operations Inspector)

**Salary:** Master Pay Scale Point 45 (HK$94,905 approximately US$12,167* per month) to Master Pay Scale Point 49 (HK$109,340 approximately US$14,017* per month) (See Note 1).

(*Based on exchange rate of HK$7.8 = US$1) (subject to fluctuation)

**Entry Requirements:** Candidates should have (a) (i) a current Airline Transport Pilot's Licence (ATPL) (Aeroplane) with a current Class One Medical Certificate and eight years' relevant post-licence experience and at least 5,000 hours of commercial transport flying experience of which a minimum of 3,000 hours should be on civil transport multi-engine aeroplanes; **OR** (ii) an International Civil Aviation Organization contracting state's Commercial Pilot's Licence (CPL) (Aeroplane) with Multi-engine Instrument Rating; and a minimum of seven years' post-licence experience in civil aviation management and operations or as a regulator; and have passed the ATPL examinations; **AND** (b) strong command of written and spoken English.

**Notes:**

(1) Subject to the prevailing situation, candidates with additional experience may be granted increments for previous relevant experience in the civil aviation field in excess of the stipulated minimum. Please note that applications from the serving civil service Senior Operations Officers (Senior Operations Inspector) in the Civil Aviation Department would not normally be considered.

(2) For the purpose of heightening public awareness of the Basic Law (BL) and promoting a culture of learning of BL in the community, assessment of BL knowledge will be included in the recruitment for all civil service jobs. Results of the BL test for degree/professional grades will be one of the considerations to assess the suitability of a candidate but will not affect his/her eligibility for applying for civil service jobs. As a general principle, the main consideration for suitability for appointment remains a candidate's qualification, experience and caliber.

(3) Candidates should submit their application forms together with an **Experience Resume** by mail to the enquiry address on or before the closing date for application. The Experience Resume can be downloaded from the Civil Aviation Department's website. (http://www.cad.gov.hk/english/recruitment.html)

**Duties:** A Senior Operations Officer (Senior Operations Inspector) is mainly deployed on flight operations matters including – (a) conducting station facilities, ramp and base inspections, and other safety oversight inspections of the Air Operator's Certificates (AOC) holders to ensure that the operator's documentation with respect to operations and training manuals, and all other instructions to operating staff are in compliance with the established policies and standards; (b) observing professional pilot training, monitoring standards and ensuring that the training is carried out in accordance with all relevant legislation; (c) examining persons for appointment as authorized examiners for the grant of Private Pilot Licence and handling matters on Flying Training Organization and ground training courses; (d) investigation of aircraft accidents and incidents; and (e) assisting in the formulation of policies and requirements on flight standards and operations matters. (Notes: Post holders are required to travel extensively on duty and work irregular hours).

**Terms of Appointment:** A new recruit will normally be appointed on civil service agreement terms for three years. A gratuity may be granted upon satisfactory completion of the contract with consistently high standard of performance and conduct. The amount of gratuity payable will be the sum which, when added to the Government's contribution to the Mandatory Provident Fund Schemes, equals to 15% of the total basic salary drawn during the contract period. He/she will be required to serve on agreement terms for at least 3 years before they can be considered for appointment on the prevailing permanent terms.

**Enquiry Address and Tel. No:** For enquiry or request for an application form, please write to the Administration Division, Civil Aviation Department, Level 5, Office Building, Civil Aviation Department Headquarters, 1 Tung Fai Road, Hong Kong International Airport, Lantau, Hong Kong S.A.R., People's Republic of China. (Fax.: (852) 2910 6399) or e-mail to <recruitment@cad.gov.hk>, quoting reference "CAD PR/5-25/62 (2015)".

**Closing Date of Application:** 14 August 2015

**General Notes:**

(a) Persons who are not permanent residents of the Hong Kong Special Administrative Region (HKSAR) may also apply for this vacancy but will be appointed only when no suitable and qualified candidates who are permanent residents of the HKSAR are available.

(b) As an Equal Opportunities Employer, the Government is committed to eliminating discrimination in employment. The vacancy advertised is open to all applicants meeting the basic entry requirement irrespective of their disability, sex, marital status, pregnancy, age, family status, sexual orientation and race.

(c) Civil service vacancies are posts on the civil service establishment. Candidates selected for these vacancies will be appointed on civil service terms of appointment and conditions of service and will become civil servants on appointment.

(d) The entry pay, terms of appointment and conditions of service to be offered are subject to the provisions prevailing at the time the offer of appointment is made.

(e) The information on the maximum pay point is for reference only and may be subject to changes.

(f) Fringe benefits include paid leave, medical and dental benefits, and where appropriate, assistance in housing.

(g) Where a large number of candidates meet the specified entry requirements, the recruiting department may devise shortlisting criteria to select the better qualified candidates for further processing. In these circumstances, only shortlisted candidates will be invited to attend recruitment examination and/or interview.

(h) It is Government policy to place people with a disability in appropriate jobs wherever possible. If a disabled candidate meets the entry requirements, he/she will be invited to attend the selection interview/written examination without being subject to further shortlisting.

(i) Holders of academic qualifications other than those obtained from Hong Kong institutions/Hong Kong Examinations and Assessment Authority may also apply but their qualifications will be subject to assessments on equivalence with the required entry qualifications. They should submit copies of their official transcripts and certificates by mail to the above enquiry address.

(j) Civil service vacancies information contained in this column is also available on the GovHK on the Internet at http://www.gov.hk

(k) Towards the application deadline, our on-line system would likely be overloaded due to large volume of applications. To ensure timely completion of your on-line application, it is advisable to submit the application as early as possible.

**How To Apply:** Application Forms [G.F. 340 (Rev. 3/2013)] can be downloaded from the Civil Service Bureau of HKSAR's website (http://www.csb.gov.hk). **Candidates must state clearly the details of professional qualification obtained on the application forms and attach the Experience Resumes.** (See Note 3) Completed forms, together with the Experience Resumes, should reach the above enquiry address of the recruiting department on or before the closing date for application. Please specify the title of the post being applied for on the envelope. Online application can also be made through the Civil Service Bureau's website (http://www.csb.gov.hk). Candidates who apply online should submit **the Experience Resumes within one week after close of application period** to the above enquiry address, and the online application number should be quoted on the envelopes and the Experience Resumes. **If candidates fail to provide the Experience Resumes as requested by the deadline, their applications may not be considered.** Applicants are encouraged to provide their email addresses on the application forms. Candidates who are selected for interview will normally receive an invitation (by email or by post) in about six to eight weeks from the closing date for application. Those who are not invited for interview may assume that their applications are unsuccessful. For enquiries, please contact the department via the means stated above.

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**Contact: Mr Frank McMeiken, Manager Air Traffic Control, Guernsey Airport on 01481 234950 or email: frank.mcmeiken@gov.gg**

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WORK EXPERIENCE SCOTT TYRRELL

# A scientific search for safer skies

Scott Tyrrell is a continued operational safety specialist for the US Federal Aviation Administration Rotorcraft Directorate, investigating causes of helicopter accidents and working on the development of new safeguards

**What got you into aviation?**
I grew up in Kankakee, Illinois. A friend of the family owned [general aviation services company] Koerner Aviation and I received my first flight experience there along with my introduction to aviation history.

I enlisted in the US Air Force when I was 17. My career field was avionics and I was assigned to work on the Lockheed Martin F-16 at Hill Air Force Base in Utah. In 1991, during Desert Storm, I was assigned to a C-130 inspection unit in Frankfurt, Germany, for all in-theatre assets. This was a fast-paced job as it required accelerated inspections of all C-130 aircraft assigned to the area of responsibility.

After Desert Storm, I transferred to the 136th Airlift Wing in Dallas/Fort Worth. The 136th Airlift Wing has an incredible safety record: it just recently surpassed 168,000h of accident-free flying. Their last "Class A" accident was on 5 June 1965.

My military career was primarily focused on aviation and I had a passion for safety and accident investigation. I graduated from the Air Force Mishap investigation course and I also completed my master's degree in Aeronautical Science with a dual specialisation in management and safety.

**You kept on investigating?**
I am assigned to the US Federal Aviation Administration Rotorcraft Standards staff in Fort Worth, Texas. I work as a continued operational safety specialist and it includes accident investigation as well as industry outreach with the United States Helicopter Safety Team (USHST).



US Federal Aviation Administration

Tyrrell began his career in the USAF; he now investigates civil incidents

I enjoy accident investigation, in particular working with the National Transportation Safety Bureau, aircraft manufacturers and operators to determine the probable cause of an accident and develop safeguards so it cannot be repeated. I am also responsible for industry outreach to provide safety-related information to the helicopter industry. Another great opportunity is to share my experiences with the Transportation Safety Institute as an adjunct instructor, during basic and advanced Rotorcraft Accident Investigation courses.

> **"Experience as a pilot is extremely valuable to understanding the entire accident sequence"**

**What is the most difficult part of your job?**
By far, it's investigating fatal helicopter accidents. Since I joined the FAA, there have been 165 fatal helicopter accidents in the USA, involving 326 fatalities.

The wreckage examination is certainly one of the most critical steps in the entire process of the accident investigation. Evidence is extremely perishable; once moved, the details of the accident sequence could be hidden forever. Photographic evidence is vital to the accurate documentation of the wreckage and is often used to determine location and damage to parts. Non-destructive testing or forensic examination of broken parts is vital to the success of the examination and most often this pinpoints the root failure of the part.

**Is a maintenance background necessary?**
A background in aviation is vital to being successful in this position. Aircraft maintenance experience as well as operational experience as a pilot is extremely valuable to understanding the entire accident sequence.

**What special projects have you been working on?**
Since 2009, I have been working on a national-level team as a government representative to the USHST. This team of industry and government officials was formed to address an unacceptable civil helicopter accident rate. I was also assigned to lead an FAA team to look at the fatal accident rate from 2013 – the worst year since 1994, with 161 accidents, resulting in 74 fatalities. ■

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